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ABSTRACT

Five areas of concern relating to the Vocational-Technical Education Consortium of States (VOTECS) are documented in this report. First, following an introduction which discusses the purpose of the VOTECS system (to develop materials for performance based instruction), the organizational structure of the sixteen-state consortium is presented, including information on the administrative agency, the board of directors, the central staff, the technical coordinators, and the project directors. Second, information is given on the methods and procedures for VOTECS product development and review. The VOTECS model, occupational survey, computer systems and services, and quality control features are also discussed. Third, project status in terms of completion schedule, state diffusion strategies, and the National Institute of Education proposal are reviewed. (Of the 114 projects to develop catalogs of performance objectives and criterion-referenced measures, thirty-five are completed with catalogs now available.) Fourth, newly developed, proposed, and implemented techniques are described and the following areas are included: computer systems and services advancement; catalog revision and updating cycle; linkage between VOTECS catalogs and classroom delivery systems; third-party evaluation of VOTECS; and the Delphi technique for long range planning techniques. Lastly, information is given on the fees for membership and the catalogs. The following information is appended: the VOTECS bylaws; names and addresses of board members, staff members, and technical coordinators in member states; VOTECS staff resumes; and a table of project titles with corresponding job titles. (JH)

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VTECS

VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES

Fourth Progress and Information Report of the Vocational-Technical Education Consortium of States

JULY, 1977

Commission on Occupational Education Institutions
Southern Association of Colleges and Schools
795 Peachtree Street, N.E.
Atlanta, Georgia 30308

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PREFACE

The Vocational-Technical Education Consortium of States (V-TECS) is a cooperative effort involving sixteen State Divisions of Vocational Education, the Air Training Command U.S. Air Force, and the U.S. Naval Education and Training Command. V-TECS encourages and promotes the adoption of performance-based instruction in vocational-technical education programs through research and development efforts. Catalogs of performance objectives, criterion-referenced measures, performance guides, and associated tool and equipment lists, and incumbent worker response data are produced to serve as a basis for curriculum development. Detailed dissemination and diffusion plans are developed and implemented by member states to insure that these catalogs, along with instructions on their use and application, reach the local users.

This Fourth Progress and Information Report of the Vocational-Technical Education Consortium of States documents:

1. V-TECS organization structure,
2. methods and procedures for products and reports development,
3. products and reports status,
4. newly developed, proposed, and implemented techniques, and
5. information for V-TECS membership.

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Chapter 1

INTRODUCTION

The primary purpose of V-TECS is to develop valid catalogs of performance objectives, criterion-referenced measures, and performance guides for use in vocational-technical education curriculum development. The Consortium consists of sixteen states and two associate member agencies. The member states are Alabama, Delaware, Florida, Georgia, Indiana, Kentucky, Louisiana, Maryland, Michigan, Mississippi, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia, and Wisconsin. The Air Training Command, U.S. Air Force (represented by the Community College of the Air Force) and the U.S. Naval Education and Training Command are associate members. Figure 1 shows the geographic location of the V-TECS member states.

A comprehensive activity model was developed by V-TECS for use by all states in the membership to guide the development, refinement, production, diffusion, and updating of products. The implementation of uniform methods and procedures enhances the transportability of products, with a minimum of adaptation, across member states.

Projects are established following an analysis and selection of occupational domain areas for catalog development. For each domain, a state-of-the-art study is conducted and preliminary lists of tasks and tools and equipment are developed based upon the review of existing literature. These preliminary lists are refined by extensive interviewing of incumbent workers and supervisors. The occupational inventory is then compiled and administered to a random sample of incumbent workers. Responses are obtained relative to task performance, task time-spent, task difficulty (optional), and tool and equipment utilization. The data are amassed by computer and several standard reports are generated. These reports are used by writing teams to determine those tasks to be converted to performance objectives. A field review version of the catalog of performance objectives, criterion-referenced measures, and performance guides is prepared, field tested, and refined. The final catalog is then developed. Each member state is also required to develop and implement a diffusion plan to insure that

the products reach the local users.

V-TECS has several secondary purposes as it develops and operates. These secondary purposes are to:

1. share research and developmental costs,
2. minimize duplication of effort in occupational analysis and curriculum development,
3. share the cost of expensive computer equipment,
4. share the cost of expensive technical personnel, and
5. promote the concept of performance-based vocational-technical education with the learner as the focal point.

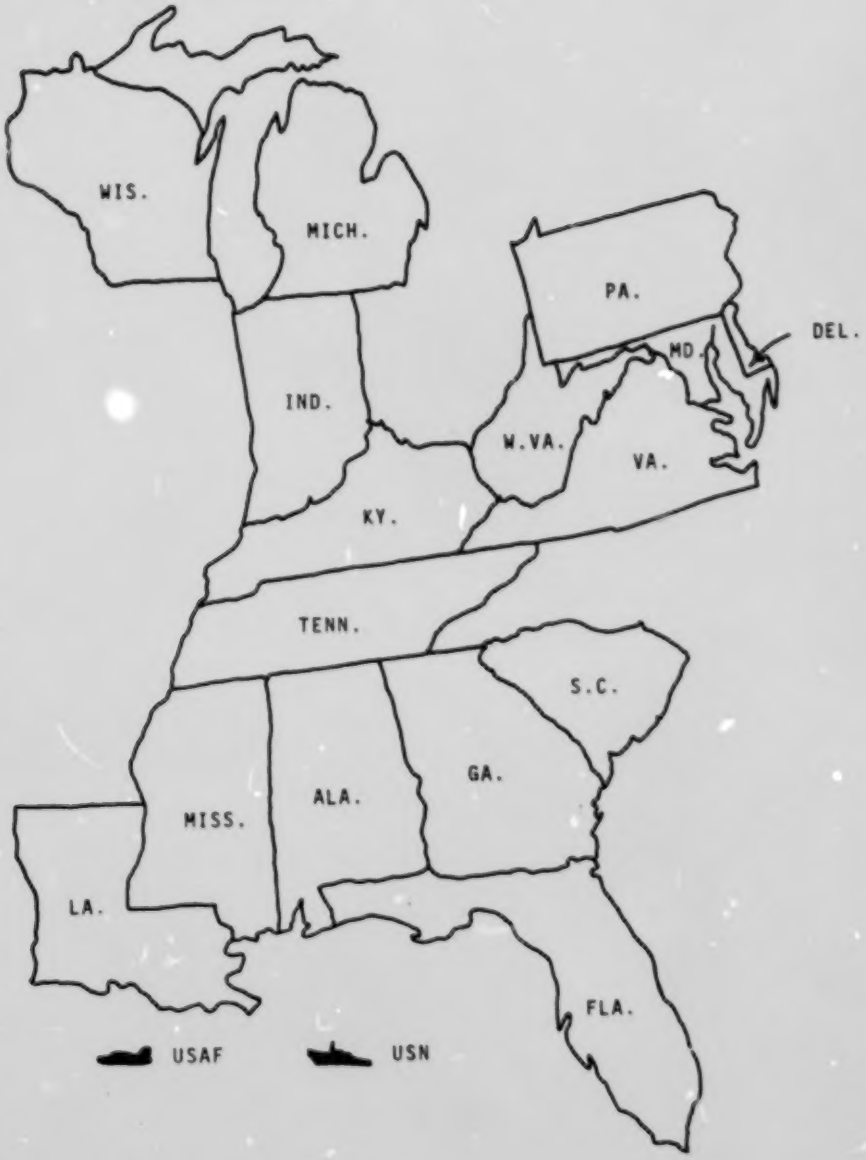

Figure 1

V-TECS Membership

Chapter 2

ORGANIZATIONAL STRUCTURE

Administering Agency

The administering agency of the Vocational-Technical Education Consortium of States is the Southern Association of Colleges and Schools (SACS). SACS is organized exclusively for educational purposes, with the objective to improve education in the South and the Nation through exercise of leadership and the promotion of cooperative efforts among colleges, schools, and related agencies. Member institutions of SACS are grouped into the Commission on Elementary Schools, Commission on Secondary Schools, Commission on Occupational Education Institutions, and Commission on Colleges.

V-TECS is a program under the Commission on Occupational Education Institutions, Southern Association of Colleges and Schools. COEI has prime responsibility for the accreditation of post-secondary vocational-technical education institutions not covered by other commissions within the SACS structure. COEI provides regional and national leadership in its prime area of responsibility and promotes the improvement of vocational-technical and career education through various research and evaluation activities. COEI has a continuing interest in the improvement of vocational-technical education in the South and the Nation.

Figure 2 illustrates the organizational structure and operational relationship of SACS/COEI/V-TECS. SACS/COEI provides a well-established and effective organizational base for V-TECS operations. SACS provides central services, technical assistance, and administrative advice to V-TECS as needed and requested by the Board of Directors or the Executive Director of V-TECS. Fiscal controls, personnel management, auditing, and other services available to members of SACS are provided to V-TECS on a shared-cost basis.

Board of Directors

The Board of Directors of V-TECS consists of one person from each state holding membership status in V-TECS. In addition, an alternate member is named to attend meetings in the absence of the regular member. A member or alternate

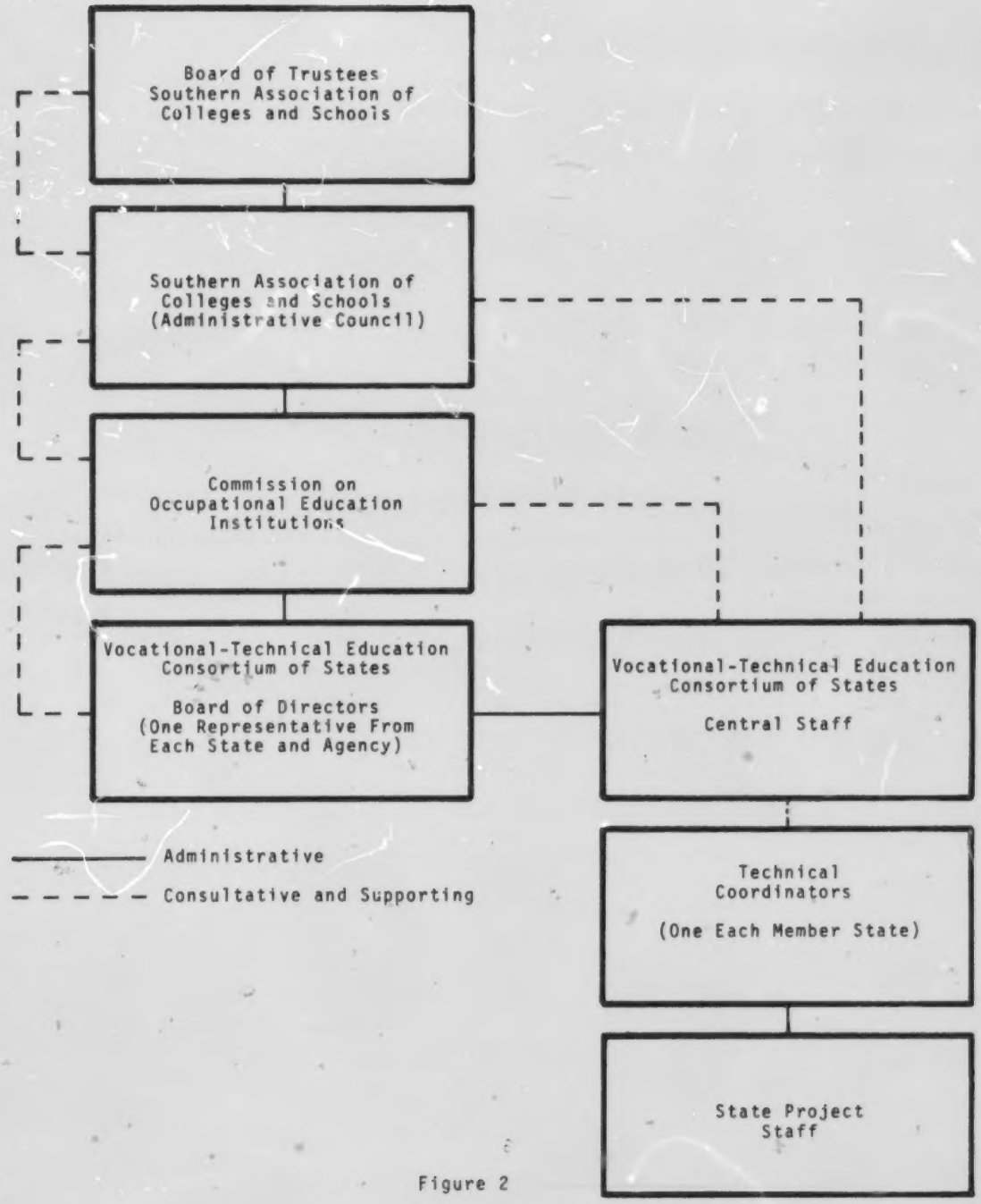

Figure 2

Organization Plan for V-TECS

may cast only one vote for the participating state, although both may be present during a meeting. The associate membership status held by the Air Training Command, U.S. Air Force and the U.S. Naval Education and Training Command carries no voting privilege. The associate members participate in discussions, serve on committees, and provide advice and technical assistance, as needed and requested by V-TECS.

The members of the V-TECS Board are appointed by the person designated in each state's Plan for Vocational Education as the State Director of Vocational Education. Appointments are for periods of time governed by the State Director of Vocational Education. Such reappointments and/or appointments of a new representative are the option of the participating state. Appendix B (pink section) contains a listing of the Board Members, Alternates, and State Coordinators.

The Board serves as the policy-making body for the Consortium and functions in committee roles to provide advice, technical assistance, and policy direction to the Executive Director of V-TECS. Each Board member serves on at least one committee to study concerns brought forth and to recommend policy changes. The Board's four committees are the Executive Committee, Planning Committee, Product Development Committee, and Evaluation Committee (See Appendix C--blue section--for list of membership). In addition, a Technical Coordinators Task Force functions through the Product Development Committee. The functions and roles of the committees follow.

Executive Committee. The purposes of this committee are to:

1. periodically review the Bylaws of V-TECS,
2. make recommendations for revision in keeping with the Articles set forth,
3. review and interpret proposed and adopted policy changes in terms of their effect on the Bylaws,
4. provide direction and advice in the preparation of prospective proposals, and
5. review personnel requirements and make recommendations on hiring new personnel.

Appendix A (buff section) contains the Bylaws for V-TECS. Detailed minutes have been kept for the seventeen meetings of the V-TECS Board of Directors. These minutes are the official source of policies, procedures, and practices

adopted and used in the operation of V-TECS.

Planning Committee. The purposes of this committee are to develop and recommend goals and objectives for the Consortium and to develop and recommend plans for reaching approved goals and objectives.

Product Development Committee. The primary purpose of this committee is to analyze and promote decisions concerning product development in regard to format, content, quality control, standards criteria and dissemination/diffusion. This committee serves as a clearinghouse for concerns expressed by the Technical Coordinators through the Technical Coordinators Task Force. The specific role of this committee is to develop alternative methods of conducting occupational analysis and delineate alternative methods of delivery systems.

Evaluation Committee. The primary purpose of this committee is to recommend policies for the evaluation of each activity of the V-TECS Activity Model. The scope of this committee excludes primary responsibility for formative evaluation of the V-TECS products. This committee examines results of an independent third party evaluation and recommends policy for internal evaluation of each activity of the V-TECS Model.

Technical Coordinators Task Force. This task force provides a formal structure for obtaining feedback from Technical Coordinators. Information concerning the problems in implementing policies and procedures is made available to enhance the quality of decisions. The concerns of project personnel are brought to the Task Force through the individual state Technical Coordinator. A representative of this Task Force meets jointly with the Product Development Committee. In addition, each Technical Coordinator is encouraged to communicate directly with the state's Board Member.

Central Staff

The V-TECS Central Staff consists of the Executive Director of V-TECS and five Technical Consultants. The Executive Director is the chief administrative officer of the Consortium and provides direction to the staff and other technical personnel in keeping with Board policies. The central staff members have substantive experience and expertise in vocational-technical education, occupational analysis, and curriculum design and implementation. Technical expertise

in the areas of research design, sampling techniques, data analysis, and computer program development is also represented. Staff resumes are included in Appendix D (green section) of this report.

The primary function of the V-TECS Central Staff is to provide technical assistance and guidance to the member states in order to help assure that high-quality products are produced. Each staff member is assigned primary or secondary responsibility for providing services. Specifically, staff members work with the state Technical Coordinators to:

1. provide technical assistance in planning V-TECS related research activities,
2. provide technical assistance in the design and implementation of occupational surveys,
3. provide technical assistance in the development of catalogs of performance objectives, criterion-referenced measures, and performance guides,
4. conduct individual training and in-service training workshops for the state Technical Coordinators in directing, managing, and monitoring V-TECS projects,
5. develop and implement a system for computer storage and retrieval of the occupational survey data and catalog data,
6. analyze data and disseminate special statistical computer reports, and
7. coordinate the design and implementation of dissemination and diffusion activities.

In addition, support activities performed by the V-TECS Central Staff are to:

1. conduct research in the areas of performance objectives, criterion-referenced measures, and education consortia, and
2. develop coalitions with business, industry, and other public and/or private agencies or foundations to support efforts of V-TECS.

Technical Coordinators

The Technical Coordinator has two functions: (1) to act as liaison between the state projects and the Central Staff and (2) to serve as a technical resource person for project personnel within the state. The Technical Coordinator has a key role in the success of projects in a particular state. The preparation and training of this person is vital to the proper functioning of the Consortium and the activities within the state. Administratively, the Technical Coordinator

is responsible to an administrator in the state.

Duties and responsibilities within the state. Within the state, the Technical Coordinator provides the following services and performs the following functions:

1. Monitors projects in developing catalogs of performance objectives and criterion-referenced measures in accordance with the Memorandum of Agreement.

2. Serves as a resource person for project personnel within the state during Domain Study activities.

3. Reviews all reports and products developed within the state to assure that quality criteria have been met.

4. Supervises the survey of incumbent workers (follow-up activities only) inside the state to assist in obtaining adequate responses to the occupational inventory.

5. Serves as a resource person for the interpretation of task analysis data to personnel within the state.

6. Assists in the preparation and training of personnel serving on writing teams to convert task analysis data and task statements to performance objectives.

7. Provides technical assistance and training for project directors so that products are delivered on time and meet acceptable quality standards.

8. Provides technical advice and assistance to personnel in the state during the field test, field utilization studies, and implementation phases of the catalogs.

9. Assists in the development of the state's dissemination plan and in-service training plan for implementing the use of the catalogs of performance objectives and criterion-referenced measures.

Responsiveness to the Central Staff. The Central Staff has Technical Consultants whose primary responsibility is to work with and assist the Technical Coordinators in the member states. The working relationships of these must be rather close, so that an acceptable quality level of products, training of personnel, and procedures used to develop catalogs can be maintained. In view of these key items, the Technical Coordinators in each state are expected to be responsive to the Central Staff as follows:

1. to participate in all training programs, seminars, and conferences developed and conducted by the Consortium,

2. to attend other specialized training sessions, courses, conferences, and seminars prescribed by the Board of Directors of V-TECS,

3. to serve as a technical resource person to projects within the state and make necessary reports required under provisions of the Memorandum of Agreement,

4. to review all reports and products produced in the state through its project efforts prior to submitting to the V-TECS Staff, and

5. to provide periodic Progress reports of projects to the V-TECS Staff at intervals set by the Board of Directors of V-TECS.

A listing of names, titles, and mailing addresses of the Technical Coordinators is included in Appendix B (pink section) of this report.

Project Directors

In most member states, a Project Director is named to conduct the preliminary research and develop or direct the development of the reports and products required for project completion. These persons are selected based upon their background and experience in the occupational domain area under study. The Technical Coordinator is responsible for ensuring that Project Directors are trained to competently perform the tasks associated with catalog development. All products are developed under the supervision and guidance of the Technical Coordinator. After checking the product for quality (based upon the pre-established criteria), the Technical Coordinator submits the product to the V-TECS Central Staff for review and approval. A list of current Project Directors across the membership is provided in Appendix B (pink section) of this report.

CHAPTER 3

METHODS AND PROCEDURES

V-TECS products are developed using a consistently applied procedure in each member state and reviewed in terms of methodology, content, and format prior to distribution. The topics within this section of the report provide information regarding the methods and procedures implemented by V-TECS to insure a high degree of confidence in products being developed and transportability of the products.

The V-TECS Model

A comprehensive activity model was developed by V-TECS for use by all states. The model consists of 12 major activities and 47 sub-activities. Some activities of the model include:

1. determination of catalog priorities,
2. project planning,
3. training of technical personnel,
4. state-of-the-art research,
5. developing occupational survey instruments,
6. surveying job incumbents,
7. preparing field review and final catalogs of performance objectives, criterion-referenced measures, and performance guides,
8. developing in-service dissemination and diffusion plans,
9. revising and updating information, and
10. third-party evaluation for self-renewal.

The V-TECS model was developed based upon a thorough study of the experience of the states of Alabama, Florida, Michigan, Utah, Massachusetts (Project CAREER), and upon other agency activity including the Air Training Command, U.S. Air Force and the Education Testing Service of Princeton, New Jersey. As a result of this study, an a prior model was derived and submitted to a nationally selected jury of experts using the Delphi Technique. The jury of experts provided input leading to the sequencing of the sub-activities of the V-TECS Model. The jury also provided information concerning the relative

importance of each sub-activity under realistic and idealistic constraints. The study was published by the Commission on Occupational Education Institutions, Southern Association of Colleges and Schools. Figure 3 illustrates the sequencing of the 12 major activities of the V-TECS Model. A comprehensive research report including details on the development of the V-TECS model is available upon request.

Occupational Surveys

Comprehensive job-based occupational inventories are a critical part of the occupational survey process. Preliminary lists of tasks, tools, and equipment are developed through a thorough review of existing literature. The preliminary lists are refined and validated by extensive interviewing of incumbent workers and supervisors in the occupational area to be surveyed. The interviewing process ends only when workers and supervisors cannot add to the duties, tasks, tools, or equipment in the occupational inventory. The occupational inventories are then distributed in a tightly controlled sample design of incumbent workers. Information is collected on task time-spent, task difficulty (optional), job descriptions, equipment utilization, and cumulative task time-spent by specific job title. Data responses are amassed by use of electronic data processing equipment and results are analyzed statistically for reliability, variance, and deviation. Table 1 includes information concerning V-TECS survey data for 42 projects in terms of the state developing the project, project title, project number, sample size, usable response rate, and reliability of responses to the inventory.

Computer System and Services

SACS has a contract with Office of Computing Activities, The University of Georgia, to have access to two IBM 370/158 and a Cyber 70. An IBM 3776 remote job entry system, consisting of a Control Unit 300 per minute card reader and a 300 line per minute printer, is located in the V-TECS Central Office in Atlanta. Also, located in the Central Office is a Cathode Ray Tube which is used in conjunction with an IBM 3776 terminal on-line with the University of Georgia.

Data from the surveys of incumbent workers and the performance objectives, criterion-referenced measures, and performance guides contained in final catalogs are stored on disc. Two data banks are maintained: the Occupational Information Data Bank and the Catalog Data Bank. These data banks are linked by a common file and may be accessed independently or in association. They are accessed to produce

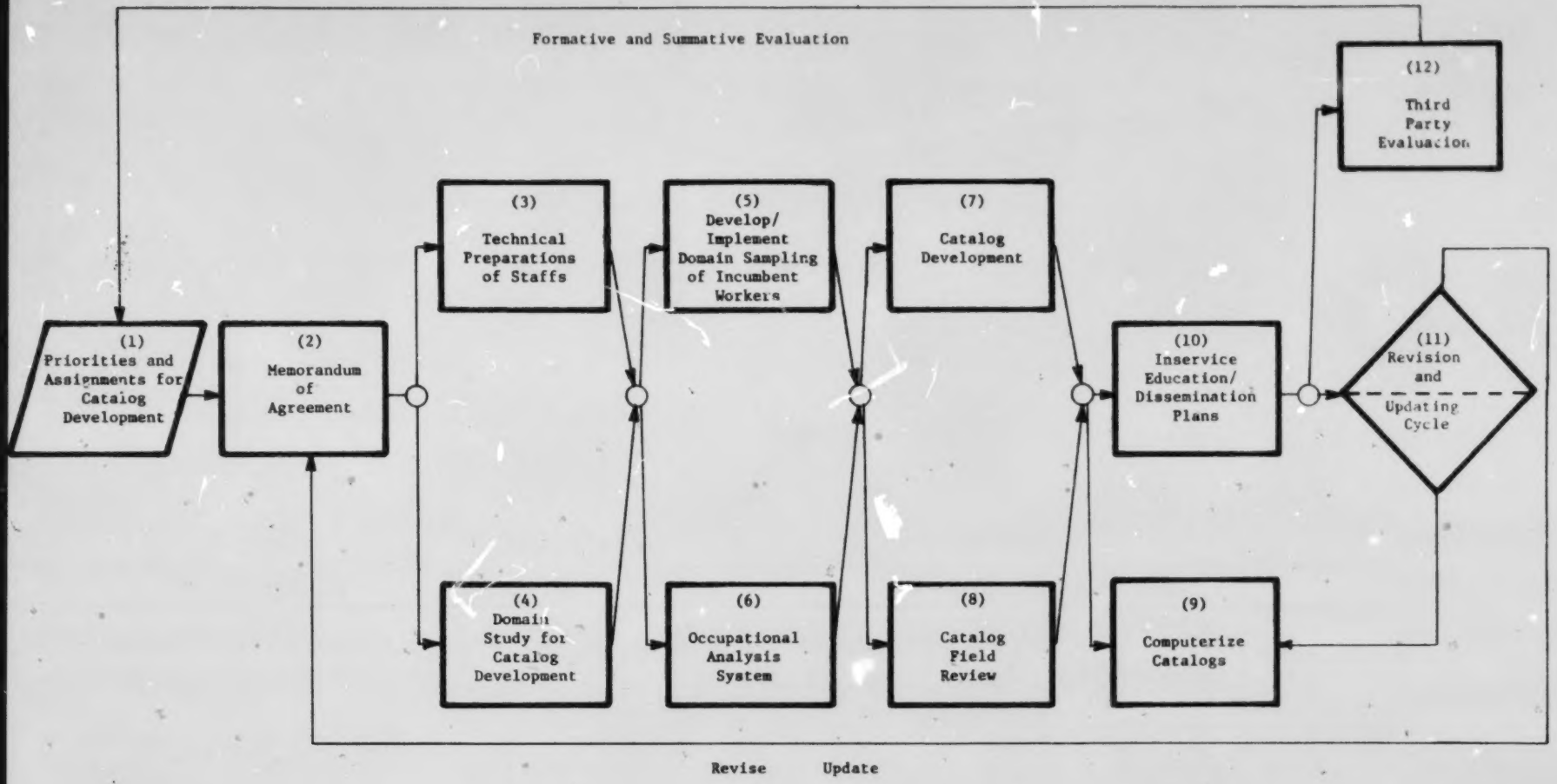
Formative and Summative Evaluation
(1) Priorities and Assignments for Catalog Development
(2) Memorandum of Agreement
(3) Technical Preparations of Staffs
(4) Domain Study for Catalog Development
(5) Develop/ Implement Domain Sampling of Incumbent Workers
(6) Occupational Analysis System
(7) Catalog Development
(8) Catalog Field Review
(9) Computerize Catalogs
(10) Inservice Education/ Dissemination Plans
(11) Revision and Updating Cycle
(12) Third Party Evaluation
Revise
Update

Figure 3.
V-TECS Model for Developing Catalogs of Performance Objectives
and Criterion-Referenced Measures

Table 1

Response Rate and Reliability by Project
as of July, 1977

PROJECT	STATE	ORIGINAL SAMPLE SIZE	USABLE RATE IN PERCENT	RELIABILITY COEFFICIENT	DOMAIN
1111	AL	172	62.8	.9244	AIR CONDITIONING
1112	AL	166	74.7	.9422	RADIO/TV
1120	AL	162	72.8	.8486	NURSERYMAN
1121	AL	269	57.2	.8388	BOOKKEEPER
1122	AL	140	90.7	.8672	AUTO PARTS CLERK
1123	AL	762	65.5	.9360	LICENSED PRACTICAL NURSE
1124	AL	138	87.7	.9184	ALTERATIONIST
1125	AL	166	86.8	.8528	COSMETOLOGY
1126	AL	136	79.4	.9256	BRICKLAYER
3001	DL	107	68.2	.9001	SHEET METAL
3002	DL	120	75.8	.8383	WAREHOUSING
1220	FL	188	98.4	.7760	SOD PRODUCTION
1221	FL	196	87.8	.8732	AUTO BODY
1222	FL	237	98.7	.9227	TURF MANAGEMENT
1223	FL	208	99.0	.9434	AUTO MECHANIC
1236	FL	154	84.4	.9029	WELDING
1237	FL	156	100.0	.7950	FLORICULTURE
1238	FL	154	98.0	.8378	HOSPITAL WARD CLERK
1239	FL	143	93.7	.9313	TAX COLLECTOR
1241	FL	94	83.0	.9041	CUSTOM DRESSMAKER

Table 1 (Continued)

PROJECT	STATE	ORIGINAL SAMPLE SIZE	USABLE RATE IN PERCENT	RELIABILITY COEFFICIENT	DOMAIN
1299	FL	126	86.5	.8926	HOUSING MANAGER
1331	GA	190	90.0	.9532	DATA PROCESSING
1332	GA	190	68.9	.9451	MACHINIST
1343	GA	115	93.9	.7861	PROGRAMMER
1344	GA	142	77.5	.9501	EMERGENCY MEDICAL TECHNICIAN
1441	KY	166	66.3	.9424	DENTAL ASSISTANT
1442	KY	235	70.2	.9248	TRACTOR MECHANIC
1443	KY	208	72.6	.8221	CASHIER/CHECKER
1444	KY	226	83.2	.9690	CARPENTER
1445	KY	329	82.7	.8505	TELLER
1446	KY	166	85.5	.9125	CHILD CARE
1454	KY	181	65.7	.8476	LEGAL SECRETARY
1455	KY	144	72.9	.9350	MEDICAL ASSISTANT
1456	KY	132	81.1	.9238	DRAPERY
1457	KY	124	55.6	.8440	FLORAL SALES
1458	KY	126			AG PARTS CLERK
2095	LA	165	81.2	.9338	SHIP OPERATIONS
3221	MD	145	51.0	.8305	EXECUTIVE SECRETARY
3222	MD	135	94.1	.8524	WORD PROCESSING
1551	MS	180	85.5	.9272	PLUMBING
1552	MS	167	94.6	.9369	LANDSCAPING

Table 1 (continued)

PROJECT	STATE	ORIGINAL SAMPLE SIZE	USABLE RATE IN PERCENT	RELIABILITY COEFFICIENT	DOMAIN
1563	MS	152	54.4	.9092	COTTON GIN
1564	MS	165	86.1	.9152	INDUSTRIAL SEWING
1571	MS	148	96.6	.8861	HEALTH CARE WORKER
2132	SC	165	77.6	.9094	TEXTILE PRODUCTION
2133	SC	148	80.4	.9239	SMALL ENGINE REPAIR
1771	VA	576	87.8	.8480	SECRETARY
1772	VA	346	89.0	.8818	FOOD SERVICE
1788	VA	150	84.7	.8437	LOGGING
1789	VA	166	92.2	.9134	NURSE AIDE

TOTAL ORIGINAL SAMPLE SIZE: 9811

USABLE RETURN RATES: 80.3% or 7878

standard or special statistical computer reports and to compile the print general or specialized cataloos upon request.

Occupational Data Bank. The occupational information data bank consists of data collected from job incumbents responses to an occupational inventory and difficulty survey instruments (optional) developed in each project. These data are collected by means of a sampling of job incumbents using a computer generated list of random numbers. These data are coded and stored by U.S. Office of Education (U.S.O.E.) and Dictionary of Occupational Titles (D.O.T.) classifications. The data bank contains a listing of the tasks, tools, and equipment in the inventory booklets. Data concerning number of job incumbents performing each task, relative time-spent in task performance, relative task difficulty, background data on job incumbents, and number of job incumbents using each tool or piece of equipment are also stored.

Catalog Data Bank. As final catalogs are completed, the performance objectives, criterion-referenced measures, and performance guides are stored by U.S.O.E. cluster and D.O.T. classification. This information is retrieved to meet individual requests and printed in a standardized format in camera-ready condition. Revision and updating of catalog content will be accomplished using the Cathode Ray Tube.

Computer Reports. Using computer software programs developed by V-TECS, survey data are stored and processed. Table 2 lists all reports available. In addition, several special computer reports are produced. These include: task time-spent organized by various ranges of years on the job; a Bayesian Statistical Design that ranks tasks in terms of the four variables--time-spent, task difficulty, members performing, and years on the job; a PERT analysis and summary of data collected using the DELPHI Technique; and statistical analyses such as T-tests and multiple regression analysis.

Quality Control Features

Workshops are conducted by the V-TECS Central Staff which are designed to prepare the Technical Coordinators to fulfill their roles as quality control monitors of products. These workshops provide in-depth training in all aspects of the V-TECS developmental model. While Technical Coordinators are the primary recipients of the instruction, each state is invited to send project personnel, thereby, reducing the training burden.

Table 2

V-TECS Computer Banks Consist of Data from
Occupational Surveys and Catalogs of Objectives

List Report #1 - Time-Spent Index by Project

List Report #2 - D.O.T. Differential by Time Spent Performing Tasks

List Report #3 - Standard Deviation on Time Spent Values

List Report #4 - All Duties and Tasks for a Domain of Occupational Titles

List Report #5 - Cumulative Time-Spent by Job Title

List Report #6 - Percentage of Members Performing by Job Title

List Report #7 - Tools and Equipment by Percentage Rating

List Report #8 - Tools and Equipment by Percentage Rating

Report # 9 - Random Number Generator for Sample Selection

Report #10 - Sample Selection Worksheets

Report #11 - Product Status and Avaliability Report

Report #12 - Task Selection Worksheets/Data Summary for Writing Teams

Report #13 - Time-Spent by Job Titles or Project by:

0-12 months on the job
13-24 months on the job
25-36 months on the job
37-up months on the job

Report #14 - Tasks Time-Spent by Job Titles or Project by:

0-24 months on the job
25-47 months on the job
48-up months on the job

Report #15 - Instrument Reliability by Duty and Project for Task Time-Spent or Task Difficulty Data

Report #16 - Bayesian Statistical Analysis

Report #17 - Task Difficulty

Report #18 - PERT (Program Evaluation and Review Technique)

Report #19 - DELPHI (Used annually to identify long range goals for V-TECS)

Report #20 - Chi-Square Commonality for Projects with two or more Job Titles

Report #21 - Reports produced according to your particular parameters

Report #22 - Final Catalog Data Bank including all P.O.'s, C.R.'s, and P.G.'s, once data has been entered and edited

Report #23 - STAR Readability Analysis Program

Since performance-based instruction is the ultimate goal of V-TECS catalog development, the topics covered at each Technical Coordinator Workshop are described in performance terms indicating specific and desired learner outcomes. This enables each Technical Coordinator to be informed, prior to instruction, of the outcomes which each session is designed to accomplish. Accompanying each performance objective are criterion-referenced measures, which are offered during and/or at the close of the instructional sequence. As a result of these procedures, each participant is progressively certified as being competent on each task involved in product development

Individual training plans are in various stages of completion for each task involved in product development. These plans specify the performance objective, criterion-referenced measure, and training resource associated with task performance. In some instances, objectives may be attained on an individual study basis with the completed criterion test being mailed to the appropriate training monitor on the Central Staff for review.

Workshop topics are selected to address the immediate concerns of the member states depending upon their stage of catalog development. Entry of new states into the Consortium has resulted in a dual-track approach to instruction. Implementation of a dual-track approach allows the more experienced state personnel to attend sessions involving the latter stages of catalog development, whereby the newcomers attend sessions involving the earlier stages of catalog development.

The basic resource for training is the Technical Reference Handbook developed by the V-TECS Central Staff. This handbook is a detailed guide resulting from experiences gathered over the first 2-½ years of the Consortium's existence.

As products are developed for each project, they are submitted to the appropriate Central Staff member for review, comment, and approval. Criteria checklists for product review are in various stages of development for each product. Member states are encouraged to refer to these checklists as they develop and refine products. In most instances, these checklists are supplemented by prototype models illustrating the desired content and format. Each product is reviewed by two central staff members--one having primary responsibility and the other having secondary responsibility. If the product is dissapproved, the weaknesses are noted on the checklist and specific recommendations for revision are provided.

Chapter 4

PROJECT STATUS

The membership of V-TECS has undertaken 114 projects for the development of catalogs. As a result of these projects, occupational analyses of more than 300 job titles will be completed (See Appendix E--ivory section). This section provides information as to the projects completed, the status of projects currently under development, and an overview of state plans for diffusion.

Project Completion Schedule

To date 35 projects have been completed with final catalogs available at V-TECS. Data on the status of each V-TECS project are stored in the computer and updated using the Cathode Ray Tube. A report, "V-TECS Project Status and Product Availability Report", is printed and distributed to Technical Coordinators and Board Members each month.

The first page of the report contains explanatory information and instructions to Technical Coordinators regarding the submittal of update information on project status and product availability. The report itself is divided into three sections. Section one lists the final catalogs available at V-TECS by state, project number and the catalog occupational domain area. Catalogs without a Memorandum of Agreement processed are listed in section two by state, project number, and catalog domain area. Section three lists the catalogs under development and the product status for each project. Projected arrival dates for the product or report under development are included for each catalog in section three. Table 3 documents the V-TECS projects and product status as of July, 1977.

State Diffusion Strategies

V-TECS member states are increasingly recognizing the importance of and problems associated with diffusing catalogs within their educational boundaries. Based upon an analysis of Everette Rogers model, tentative guidelines were developed to provide a basic format for designing diffusion strategies. These guidelines were refined and approved by the V-TECS Board of Directors for use by

Table 3

V-TECS PROJECT STATUS AND PRODUCT AVAILABILITY REPORT

Final Catalogs at V-TECS

Project Number	Project Description
Alabama	
1112	Radio/TV Repairman
1120	Nurseryman
1122	Auto Parts Clerk
1123	Licensed Practical Nurse
1124	Alterationist
1125	Cosmetologist
Delaware	
Florida	
1221	Auto Body
1222	Turf Management
1223	Auto Mechanic
1236	Welder
1237	Floriculture
1238	Hospital Ward Clerk
1239	Tax Collector
Georgia	
1331	Data Prccessing
1332	Machine Operator
1343	Computer Programmer
1344	Emergency Medical Technician
Indiana	
Kentucky	
1441	Dental Assistant
1442	Tractor Mechanic
1443	Cashier/Checker
1444	Carpenter
1445	Bank Teller
1446	Child Care
1454	Legal Secretary
1456	Drapery Worker
Louisiana	
2095	Ship Operations
Michigan	
Mississippi	
1551	Plumbing
1552	Landscaping
1563	Cotton Gin Operator
Pennsylvania	
South Carolina	
2132	Textile Production
2133	Small Engine Repair
Tennessee	
Virginia	
1771	Secretary
1772	Food Service
1788	Timber Harvesting
1789	Nurse Aide
West Virginia	
Wisconsin	

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Table 3 (continued)

Assigned Catalogs without Memorandum of Agreement Processed

Project Number	Project Description
Alabama	
1133	Homemaker
Delaware	
Florida	
1244	Homemaker
1251	Farm Equipment Mechanic
1252	Commercial Art
Georgia	
1361	Medical Office Assistant
1362	Two-Way Radio Technician
Indiana	
3341	Mechanical Drafting
3342	Accounting
Kentucky	
1462	Homemaker
Louisiana	
2011	Petroleum Technician
2012	Oilfield Technician
Maryland	
3231	Lead Secretary
3233	Word Processing
Michigan	
3451	Retail Sales
Mississippi	
1572	Homemaker
Pennsylvania	
South Carolina	
2144	Homemaker
2151	Textile Worker
Tennessee	
3113	Homemaker
Virginia	
1704	Surgical Technician
1705	Industrial Maintenance
West Virginia	
4112	Mine Machine Maintenance
Wisconsin	

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Table 3 (continued)

Catalogs Under Development

Project Number	Memorandum of Agreement	State of Art	Occupational Inventory	Domain Report	Occupational Data	Pre-Writing Team Report	Field Review Catalog	Final Catalog	Final Writing Team Report
Alabama									
1111 Air Conditioning	12/05/3								
1121 Bookkeeper	11/11/4	X	X	X	X	F			
1126 Bricklayer	11/07/4	X	X	X	X	X	X	5/77	X
1132 Cattle Rancher	10/05/6	6/77							
Delaware									
3001 Sheet Metal	10/20/5	X	X	X	X	X			
3002 Warehousing	11/20/5	X	X	X	X	X			
Florida									
1299 Housing Manager	01/02/5	X	X	X	X	X	X	F	X
1241 Custom Dressmaker	07/19/6	X	X	X	X				
1242 Medical Lab Assistant	06/14/6	X	X	X	X				
Georgia									
1355 Electronic Technician	04/01/6	D							
1356 Appliance Repair	02/02/6	X	8/77						
Indiana									
3331 Agrichemical	11/15/6	X	X	X					
3332 Drafting	12/15/6	X	X	F					
Kentucky									
1453 Electrician	12/01/4	X	D	7/77					
1455 Medical Assistant	11/01/4	X	X	X	X	X	X	8/77	
1457 Floral Sales	02/15/5	X	X	X	X	8/77			
1458 Ag Parts Clerk	12/01/4	X	X	X	X	X	D	11/77	
1461 Appliance Sales	02/12/6	10/25							

Table 3 (continued)

Project Number	Memorandum of Agreement	State of Art	Occupational Inventory	Domain Report	Occupational Data	Pre-Writing Team Report	Field Review Catalog	Final Catalog	Final Writing Team Report
			Catalogs Under Development						
Louisiana									
2096 Hotel/Motel Management	02/28/5	X	X						
2013 Water/Waste Water	07/25/7								
2014 Patrolman	07/25/7								
2015 Diesel Machanic	02/28/7	X							
2021 Retail Credit	01/14/7								
2022 Butcher	01/14/7	X	F						
2023 Domestic Service	01/14/7	X							
2024 Banking Clerk	01/14/7								
Maryland									
3221 Executive Secretary	07/01/6	X	X	X	X	5/77			
3222 Word Processing	07/01/6	X	X	X	X	5/77			
Michigan									
3441 Security Guard	05/07/6	X	X	X					
3442 Printing	05/07/6	X	X	X					
Mississippi									
1564 Industrial Sewing	09/17/4	X	X	X	X	X	X	8/77	X
1571 Health Care Worker	07/16/4	X	X	X	X	9/77	D		
Pennsylvania									
South Carolina									
2145 Business Machine Repair	03/01/6	X	D	D	3/77				
2152 Ag Production	05/20/7	9/77							

Table 3 (continued)

Project Number	Memorandum of Agreement	State of Art	Occupational Inventory	Domain Report	Occupational Data	Pre-Writing Team Report	Field Review Catalog	Final Catalog	Final Writing Team Report
			Catalogs Under Development						
Tennessee									
3111 House Electrician	07/01/7								
3112 Cabinetmaker	06/17/7								
Virginia									
1790 Farm Equipment Operator	03/01/6	X	X	X	X	D	9/77		
1791 Veterinary Assistant	01/03/7	X	7/77						
West Virginia									
4111 Custodial Service		X	X	X					
Wisconsin									
4001 Industrial Maintenance Mechanic	03/11/7	X							
4002 Farm Management	03/11/7	X							

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the member states. Every member state has either developed or is in the process of developing a diffusion plan addressing the following stages:

1. Awareness
2. Interest
3. Trial
4. Evaluation
5. Acceptance or rejection

National Institute of Education Proposal

Based upon a request from the National Institute of Education, a proposal for a research project, "A System to Update and Revise Performance-Based/Competency-Based Instruction and Identify Common Task Performance Across and Between Clusters of Occupations", was submitted July, 1977. Through a system of development and implementation of revision and updating of task analysis-based catalogs and the analysis of common task performance across and between occupational clusters, a strengthening of an established link between education and work could occur. The data collected from the proposed research project and the concomitant development of computer-based analyses systems will affect curriculum development, instructional delivery systems and enhance programs of student career exploration and career guidance. The information, processes, and analytical systems developed will extend knowledge in critical areas of occupational curriculum design and planning, as well as, assist member states of the Consortium to effectively serve their vocational students.

Chapter 5

NEWLY DEVELOPED PROCESSES/IMPLEMENTED TECHNIQUES

V-TECS undertakes selected research and evaluative studies for purposes of making recommendations designed to capitalize upon opportunities for expanding the scope of services, to initiate new activities for solving identified problems, refine methods and procedures, and develop and implement long-range plans.

In the past twelve months, a significant amount of research was completed. An analysis of results and findings led to the development and/or implementation of new techniques and procedures, guidelines for project and product management, and input for Consortium planning. Progress made in the areas of computer services, catalog revision and updating cycle, linkages between V-TECS catalogs and classroom delivery systems, third-party evaluation of V-TECS, and long-range planning is discussed in this section.

Computer Systems and Services Advancement

Since July, 1976, several modifications have been implemented for improving the quality of the input occupational survey data and also in management techniques for producing various statistical reports. Modifications such as the screening of input occupational survey data has served two major purposes:

1. Assures a minimum response rate by D.O.T. for statistical inferences (Projects may have a maximum of five D.O.T.'s) and

2. Provides a degree of commonality between tasks within D.O.T.'s.

Statistical subroutines used for screening the data are (SPSS) Chi-Square Commonality and (SOPAC) clustering techniques. Other recent accomplishments are Task Time-Spent Reports by 0-12, 13-24, 25-36, 37-up months on the job with a minimum of 10 persons within each time range. Similarly, this report is produced by 0-24, 25-47, and 48-up months on the job with a minimum of 10 respondents in each cell.

With the creation of new occupational survey data files, additional management reports are produced. For example, "Task Selection Worksheets" are computerized and printed in inventory order (including write-ins) by the computer on pre-printed forms. This particular report replaces the first six lists reports.

In addition, tasks below the time-spent cutoff are identified by O.O.T. with asterisks.

Another computer based management strategy that was added in November is the "V-TECS Project Status and Product Availability Report". This report is updated and produced at the end of each month for technical coordinators and board members, while state directors receive copies bi-monthly. The last page of each report provides technical coordinators a status and a means for updating the status of their projects.

Still other V-TECS computer based management strategies are:

1. Sample Selection Worksheets. This program not only randomizes business/industries that housed the population to be surveyed but also selects the minimum sample of workers and ties the sample selection to the business/ industries identified.

2. STAR Readability Program. This report determines the reading level of various passages based upon an equation developed by Rudolph Flesh. V-TECS uses this program to determine the reading level of its catalogs. During the revision updating cycle of V-TECS catalogs, this report can provide invaluable information.

Several cost saving milestones were reached by V-TECS computer systems and services during the '76 fiscal year. Central keypunching has been implemented, thereby eliminating the need for states to transmit occupational survey data cards. Currently, all final catalogs of performance objectives, criterion-referenced measures, and performance guides are edited and entered directly into disc storage using the Cathode Ray Tube thus eliminating the need for transmitting computer cards. Editing and retrieving performance objectives and their couples will also be completed during the revision and updating cycle using the Cathode Ray Tube. Central keypunching of occupational survey data cards is estimated to provide savings of 40-50%, while entering final catalogs on the tube will provide a net saving of 50-60% of the present state's keypunching costs. Currently, V-TECS has completely edited and stored 22 catalogs onto the computer system. The goal of having 50 catalogs stored on the computer system should be reached by September, 1977.

Catalog Revision and Updating Cycle

In recognition of the need to keep V-TECS materials up-to-date and

relevant to current job needs, a systematic procedure for revising and updating the catalogs was conceptualized and incorporated as Activity II in the V-TECS model. With the relatively large number of catalogs completed and the active involvement in diffusion by member states, it is now possible and timely to focus upon refinement and implementation of Activity II. Essentially this Activity is designed to obtain input from instructional personnel, advisory committees, and incumbent workers so that catalogs may be revised according to pre-established decision criteria.

Field-based catalog utilization data will be collected over a period of time for the purposes of:

1. detecting defective performance objectives,
2. validating the standard of performance on a broader basis,
3. identifying new tasks that have evolved in the occupation,
4. collecting information on the relevance of the conditions under which the tasks are performed,
5. identifying new tools and equipment being used by workers, and
6. determining if the standards of task performance continue to be realistic in terms of current job performance requirements.

Validated instruments will be used to collect both qualitative and quantitative data over a specified reporting period. Computer software will be developed to process and analyze the data to aid in revision and updating. Work is now underway to refine and validate the instruments to be used, design decision criteria for revision and updating and finalize the procedures for data collection. It is anticipated that computer software design and preliminary data collection will begin in late fall of this year.

Linkages Between V-TECS Catalogs and Classroom Delivery Systems

V-TECS catalogs are not curriculum per se, but, are intended for use by teachers, curriculum developers, and others involved in the design of performance-based instructional materials. The catalogs provide an invaluable bank of relevant, job-based performance objectives (with associated criterion-referenced measures and performance guides). Designers may select to include or exclude specific objectives based upon organizational and/or external needs and constraints. These decisions for acceptance or rejection may be data-based and refined to specific job titles which have been studied by V-TECS.

Practical experiences in the diffusion of V-TECS catalogs have emphasized the need to explore alternate approaches to facilitate catalog utilization in design and delivery of performance-based instruction. Two approaches studied and now under consideration by the V-TECS Board are working with private publishers and implemetation of a systematic materials/media review.

Private Publishers. Initial contact was made with a few selected publishers to determine the extent of involvement in the development, mass production, marketing, and sale of curriculum materials based upon given technical specifications. As a result of these contacts, it was felt that the Consortium might be able to establish some type of legal agreement with one or more private publishers to supplement work done by the V-TECS states.

As a first step in establishing linkages with private publishers, a Request for Proposals (RFP), "RFP for the Development of Instructional Modules Based Upon Task Analysis Data," was prepared. The RFP called for the submittal of proposals for the further development of one or more pre-determined V-TECS catalogs into a modular format suitable for classroom use. Specifications as to module content, user target group, module validation, and the prototype module required as part of the proposal were detailed.

The RFP was sent to 20 publishers in November, 1976 along with a letter inviting them to attend a pre-proposal conference on December 10, 1976. Qualified publishers were identified and selected using staff recommendations based upon knowledge of past performance, existing products, and a membership directory of the Association of Media Producers (AMP). AMP is a national professional and trade association of producers and distributors of education media and related services.

The pre-proposal conference was held at the Southern Association of Colleges and Schools Office with representatives from nine publishing companies in attendance. During this meeting, the products expected were discussed in detail and other questions arising from the RFP were addressed.

Due to the fact that many of the details of concern to publishers were legal in nature, definitive answers could not be given prior to further in-depth consultation with lawyers and the V-TECS Board. Thus, most of the publishers did not feel that they had sufficient information to prepare a formal proposal. Responses were received indicating continued interest in working with V-TECS to

develop delivery formats and strategies.

After studying the responses from publishers, the V-TECS Board authorized the Executive Director of V-TECS to work with interested publishers on an individual basis to establish legal contract from the accomplishment of specific aspects of work. This direction is now being pursued to bridge the gap between catalog production and the delivery of performance-based instruction.

Materials/Media Review. It is generally agreed that teachers do not have the time nor the resources to identify existing learning resources or to develop new curriculum materials compatible with the performance objectives specified in V-TECS catalogs. Thus, a compilation of relevant existing materials and media and a description of needed resources would greatly facilitate catalog implementation.

This activity is so critical to successful catalog diffusion that a systematic procedure for learning resources identification and analysis was developed. This procedure was presented to the V-TECS Board for study as a recommended new V-TECS Model activity to be implemented consortium-wide.

The procedure consists of sub-activities which provide for a systematic committee review of existing curriculum materials, manuals, and other media. The committee could consist of a minimum of three instructors with subject matter expertise in the catalog domain area, one state supervisor of instruction or curriculum development with subject expertise, one local supervisor of instruction, and two incumbent workers representative of the job titles covered in the catalog domain. Under the supervision of the state Technical Coordinator, the committee will obtain one copy of each pertinent learning resource identified, analyze each resource, and record implications of the resource (talks about, cites examples or provides practice in the accomplishment of the task included in the performance objective). A summary of the gaps which exist in the availability of resources will also be prepared.

The V-TECS Board gave authority to the Executive Director to conduct a pilot evaluation of the proposed Activity and to seek possible sources of funds for the further development and implementation of this Activity. Accordingly, a proposal, "A Management Project to Improve the Analysis, Utilization and Revision of Performance-Based Vocational-Technical Curriculum and Instructional Materials," was prepared. This proposal was submitted to the U.S. Office of Education in

February, 1977 for FY 1978 funding under Part C of the Vocational Education Act of 1963 as amended in 1968. Although the proposal dealt with the broader area of improved curriculum management practices, the implementation of systematic procedures for learning resources identification and analysis was conceptualized as an integral and vital activity in reaching his goal.

Potential System for Subscribership. Although Consortium membership has grown significantly in the past four years, it in not anticipated that every interested state and organization in the nation will be able to acquire membership. Numerous inquiries are continuously made by non-member states and organizations as to how they might obtain and utilize specific V-TECS products and computer reports. In keeping with the Consortium's philosophy to promote the implementation of performance-based vocational education wherever possible, alternate ways and means of sharing V-TECS processes and materials with interested non-members are being explored.

The plan for sharing materials currently under consideration by the V-TECS Board is the establishment of a subscribership agreement. This agreement would allow for the purchase of V-TECS catalogs at a price agreed upon by the Board. In conjunction with the sale of catalogs, the subscriber would be required to participate in and successfully complete a specified period of technical training on the uses of the catalog.

Certain legal questions relative to implications for the sale of products outside the Consortium have been discussed with a lawyer retained by the Southern Association. The lawyer prepared a formal memorandum in response to the questions raised and attended the December, 1976 Board meeting to answer additional questions.

A draft subscribership plan was prepared outlining the costs to V-TECS and subscribers and the nature of the in-service training to be provided by V-TECS. This plan is being refined and expanded to detail responsibilities and liabilities upon the entering of contracts. The legal counsel of the Southern Association of Colleges and Schools is preparing a recommended arrangement in legal terms to permit the development of a subscriber-type membership.

Third-Party Evaluation of V-TECS

Activity Number 12 of the V-TECS Model makes provisions for third-party

evaluations of the Consortium to be conducted on a biennial basis. The first such evaluation was conducted the week of October 31 through November 6, 1976. The purpose of the evaluation was to determine the extent to which stated objectives are being (or have been) attained, major strengths and weaknesses, common problems across member states, and opportunities for improvement.

In accordance with the Board's request and with the assistance of the associate Board members, five representatives from the U.S. Air Force Air Training Command and five from the U.S. Naval Education and Training Command were authorized to serve as third-party evaluators. The final selection of the 10-person evaluation team and the design for collecting evaluative information were approved by the Board. Most of the evaluators were civilian and all were experienced in occupational analysis, criterion-referenced measurement, and implementation of performance-based instruction.

Atlanta served as the base of operations for the third-party evaluators. Following an evaluation of the V-TECS Central Office, on-site evaluations were conducted in each of the following 13 states: Alabama, Delaware, Florida, Georgia, Indiana, Kentucky, Louisiana, Maryland, Michigan, Mississippi, South Carolina, Tennessee, and Virginia. The remaining member states were not visited due to their short period of membership.

To accomplish the on-site visits, five teams (two persons each) were formed. Each of these teams visited either two or three states (depending upon the logistics involved in travel) and were charged with the responsibility of writing an evaluation report of findings for each state visited. The Technical Coordinator in each state was notified in advance and asked, if possible, to make arrangements for the evaluators to also meet with the State Director, one or more Project Directors, and one or more writing team members.

One person from each team was designated as team chairman and an overall chairman was elected by the entire group. These chairmen were responsible for finalizing the state reports and compiling a general report covering common findings and trends across all states. The general report also contained recommendations for future action prior to the submittal of the evaluation reports, an out-briefing was held in Atlanta with the V-TECS Central Staff, the Executive Secretary of the Commission on Occupational Education Institutions, and the Chairman of the Evaluation Committee of the V-TECS Board.

The overall team chairman attended the December meeting of the Board to make an oral presentation of findings and to answer questions for the purpose of clarification. At that time, each Board member received a copy of the general report and a copy of his individual state report. The Executive Director of V-TECS was requested by the Board to elicit feedback from the states evaluated and the Central Staff relative to the findings and recommendations and to compile a report of reactions and comments. Each Evaluation Committee will then consider this report in conjunction with a study of the eveluation report to derive recommendations for future action and directions.

Delphi Technique for Long-Range Planning

The Delphi Technique is a research procedure used to repeatedly probe a panel or jury of experts in an attempt to obtain a consensus of opinion. This technique was implemented by V-TECS this past year to obtain information that was used by the Planning Committee of the Board to develop a three year long-range plan. Given a preliminary list of goals and objectives, four Delphi probes were employed to further develop the goals, refine the objectives, set realistic time parameters for the accomplishment of objectives, and establish a prioritized ranking of objectives based upon importance. The panel or jury of experts consisted of all members of the Board of Directors (including alternates), the V-TECS Central Staff, and Technical Coordinators.

The Delphi Technique has been approved by the Board for implementation on a yearly basis. The Board also authorized surveying Project Directors in addition to the panel of experts previously probed. In this matter, a broad range of input can be obtained from operations personnel and policy makers. The first probe is scheduled to be mailed in late June or early July this year.

Chapter VI

INFORMATION FOR MEMBERSHIP IN THE VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES

Membership Procedure

Membership in V-TECS has been changed to an open type of membership permitting a state or associate member to enroll at any time during a fiscal year. A letter of intent to join V-TECS from the person designated as the State Director of Vocational Education followed by the completion and processing of agreement forms will constitute the membership process.

Fee Structure

Effective January 1, 1977 and each fiscal year and January 1 thereafter, the following fee structure, including one-time charges, will apply:

1. The membership fee will be FIFTEEN THOUSAND ($15,000.00) DOLLARS per fiscal year or any higher or lower established by the Board of Directors of V-TECS.

2. A one-time charge of TEN THOUSAND ($10,000.00) DOLLARS for the first fifteen (15) catalogs selected from the completed list of catalogs and ONE THOUSAND ($1,000.00) DOLLARS for each catalog above the first fifteen selected will be charged.

3. A state joining after January 1 of a fiscal year would pay seventy-five percent of the first year's membership fee plus the current membership fee for the ensuing year as well as one-time charges.

For additional information concerning membership in V-TECS write:

Dr. Ben A. Hirst, Jr.
Executive Director

Vocational-Technical Education
Consortium of States
Southern Association of Colleges and Schools
Commission on Occupational Education Institutions
795 Peachtree Street, N.E.
Atlanta, Georgia 30308
Telephone: (404) 875-8011

APPENDICES

APPENDIX A

BYLAWS OF V-TECS

THE VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES FOR THE DEVELOPMENT OF CATALOGS OF PERFORMANCE OBJECTIVES AND CRITERION-REFERENCED MEASURES IN OCCUPATIONAL EDUCATION

BYLAWS

ARTICLE I.

Name

The name of this organization shall be the VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES (V-TECS).

ARTICLE II.

Purposes and Objectives.

The purpose and objectives of V-TECS shall be to:

a. secure participation of divisions, departments, or bureaus of vocational-technical education in state educational agencies (or their appointed representatives) in cooperative efforts for the purpose of producing and exchanging catalogs of performance objectives and criterion-referenced exercises in occupational education;

b. develop, implement, and evaluate standard performance criteria to be utilized in the production of catalogs by each participating state to assure quality control and transportability of materials;

c. develop, implement, and evaluate a system for periodically updating and revising catalogs developed by member states;

d. secure additional technical or financial assistance from business and industry, other interested state or Federal agencies and educational foundations; and

e. promote the concept to performance-based education as a means of improving curricula and providing for increased accountability in occupational education.

ARTICLE III.

Membership

Section 1. Membership in V-TECS shall consist of active membership and associate membership.

Section 2. "Active Membership". Any state educational agency (or its appointed representative) desirous of participating in the organization (participation being as submission of a letter of intent to, or a contract or grant for the member's proportional share of administrative costs including a commitment to develop or refine agreed upon catalogs) is entitled to become an active member of the organization.

Section 3. "Associate Membership". Any state, Federal or non-profit private agency desirous of participating in the organization (participation being defined as (1) a contract or grant for the member's proportional share of administrative costs, or (2) "in-kind" services consisting of the assignment of personnel, products and systems under development) is entitled to become an associate member of the organization, pending approval by a majority vote of the Board of Directors.

ARTICLE IV.

Board of Directors

Section 1. Number of Directors. The business, property and affairs of V-TECS shall be managed by a Board of Directors consisting of one person from each state designated an "active member." Each "associate member" of the organization will be encourage to appoint one person to serve as a member of the Board of Directors. The Executive Secretary of the Commission of Occupational Education Institutions will also serve as a member (ex officio) of the Board of Directors. Directors representing "active members" will have voting privileges while Directors from "associate members" and the Executive Secretary, Commission on Occupational Education Institutions, will not have voting privileges.

Section 2. Membership on Board of Directors. Each active member state of V-TECS shall be authorized to have one voting member of the Board. The Board member shall be appointed by the State Director of Vocational Education (as identified in the current State Plan for Vocational Education). The State Director

of Vocational Education shall also identify a person to serve as an alternate member of the Board of Directors.

Section 3. Qualifications of Directors. Each person serving on the Board of Directors should have experience in curriculum development, evaluation methodology or related research in Occupational Education.

Section 4. Power to Make Bylaws. The Board of Directors shall have power to make and alter any Bylaw or Bylaws, provided, that the Board shall not make or alter any Bylaw or Bylaws, fixing the qualifications, classification or term of office of any member or members of the then existing Board.

ARTICLE V.

Administering Agency.

Section 1. Administering Agency. An Administering Agency shall be retained by the Board of Directors of V-TECS to provide technical assistance and coordination of activities for the member states. The agency shall have regional or national visibility and the capability of developing broad-based contract and alliances to the attainment of the organization's objectives.

Section 2. Financial Support of the Administering Agency. Each state participating as an active member of the organization shall assume a proportional share of the operational expenses of the Administering Agency. These expenses shall be stablished annually by the Board of Directors and shall be payable between establishment of intent to participate and November 30 of the appropriate fiscal year.

Section 3. Employment of Staff. The Administering Agency with approval of the Board of Directors will employ staff as required to fulfill the Consortium responsibilities. An Executive Director shall be employed to supervise this staff, implement policies of the Board of Directors, serve as secretary to the Board and be an ex officio member of all standing committees.

Section 4. Fiscal Accounting by Administering Agency. An annual audit of all monetary receipts and disbursements shall be made by the Administering Agency. This audit shall be made by a certified public accounting firm selected by the Administering Agency and, upon receipt, shall be submitted to the Board of Directors for review and reaction.

ARTICLE VI.

Officers.

Section 1. Chairman. The Chairman shall preside over all meetings of the Board and shall see that recommendations and resolutions of the Board are carried into effect. In addition, he shall serve as chairman of the Executive Committee and shall be a member of the Planning Committee and serve as an ex officio member of all standing committees.

Section 2. Vice-Chairman. The Vice-Chairman shall perform the duties and exercise the powers of the Chairman during absence or disability and shall serve on the Product Development Committee.

Section 3. Parliamentarian. The Parliamentarian shall see that business meetings are conducted in a manner consistent with adopting parliamentary procedures and shall serve on the Evaluation Committee.

Section 4. Past Chairman. The Past Chairman shall serve on the Executive Committee in an advisory capacity.

Section 5. Election of Officers. The Chairman, Vice-Chairman and Parliamentarian shall be voting members of the Board of Directors and shall be elected annually by a majority vote of the Board. The normal rotation cycle shall be from Parliamentarian to Vice-Chairman. The election of Officers shall occur during the last regular meeting of each fiscal year. In the event of the inability of any officer to serve, the next officer in the rotation cycle will move to the next position and the Parliamentarian will be elected at the next regular meeting of the Board.

ARTICLE VII.

Meetings of the Board of Directors.

Section 1. Frequency of Meetings. Regular meetings of the Board of Directors of V-TECS will be held quarterly. Special meetings may be called by the Board Chairman or by a majority of the voting members of the Board.

Section 2. Notification of Meetings. All members of the Board of Directors shall be notified in writing at least twenty days prior to the meeting. The Executive Director of V-TECS shall inform the Board Members of the location and time of all meetings.

Section 3. Attendance of Meetings. All members of the Board of Directors shall be expected to attend regular and special meetings. In the event a member of the Board is unable to attend a meeting, the designated alternate board member from that state will serve as board member. The names of appointed board members and alternates will be submitted to the Chairman of the Board and the Executive Director of V-TECS at the first regularly scheduled meeting of the Board after that state becomes a member. Any change in the person appointed as board member or alternate shall be immediately reported in writing from the State Director of Vocational Education to the Chairman of the Board of Directors and the Executive Director of V-TECS.

Section 4. Number of Votes to Which Each Director is Entitled. At all meetings of the Board of Directors, each member state shall have one vote.

Section 5. Quorum at Director's Meeting. A majority of active members of the Board of Directors shall be necessary to constitute a quorum for transaction of business.

ARTICLE VIII.

Standing Committees.

There shall be four standing committees of the Board of Directors of V-TECS: Executive Committee, Planning Committee, Product Development Committee, and Evaluation Committee.

The membership of the Executive Committee shall be the elected officers, the Executive Secretary of SACS/COEI and the Executive Director of V-TECS. The membership of the Board shall be evenly distributed among the three remaining committees with committee appointments being made by the Chairman; except that the Chairman shall serve on the Planning Committee, the Vice-Chairman shall serve on the Product Development Committee, and the Parliamentarian shall serve on the Evaluation Committee.

APPENDIX B

BOARD OF DIRECTORS, ALTERNATES, AND TECHNICAL COORDINATORS IN MEMBER STATES

STATE	BOARD MEMBER	ALTERNATE	TECHNICAL COORDINATOR
ALABAMA	Miss Ruth Stovall, Branch Director Program Services State Department of Education State Office Building Montgomery, Alabama 36104 (205) 832-3285	Mr. James Kendrick Curriculum Specialist Division of Vocational Education State Department of Education State Office Building - Room 855 Montgomery, Alabama 36104 (205) 832-3473	(Same as Alternate)
DELAWARE	Mr. Adam Fisher, State Supervisor Vocational Education Department of Public Instruction Townsend Building Dover, Delaware 19901 (302) 678-4681	Mr. W. J. Kistler Curriculum Coordinator Paul M. Hodgson Vocational-Technical School 83 East Main Street Newark, Delaware 19711 (302) 731-2405	Dr. Patricia C. Stetson, Coordinator Occupational In-Service Education College of Education University of Delaware Newark, Delaware 19711 (302) 738-1198 or 738-2573
FLORIDA	Dr. John F. Crittenden Bureau of Research, Dissemination and Evaluation Vocational-Technical Education Knott Building Tallahassee, Florida 32304 (904) 487-1735	Dr. Patsy Agee, Chief Bureau of Research, Evaluation and Diffusion Knott Building Tallahassee, Florida 32304 (904) 488-8401	Dr. Wallace D. Hunter Technical Coordinator V-TECS Project 226 West Jefferson Street State Department of Education Tallahassee, Florida 32304 (904) 487-2326 or 487-2327
GEORGIA	Mr. Wiley Simpson, Coordinator Vocational Research and Evaluation Room 306 - State Office Building Atlanta, Georgia 30334 (404) 656-2521	Mr. Waldor E. Thalleen Education Research/Planning Specialist Office of Adult and Vocational Education State Department of Education Atlanta, Georgia 30334 (404) 656-2521	Mrs. Mary Harville Technical Coordinator State Department of Education State Office Building Room 25? Atlanta, Georgia 30334 (404) 656-2521
INDIANA	Mr. Ed Hornback, Coordinator Research and Exemplary State Board of Vocational and Technical Education 17 West Market Street Indianapolis, Indiana 46204 (317) 633-7673	Dr. Bill West, V-TECS Coordinator Indiana V-TECS E & T Building 445 Blake Street Indianapolis, Indiana 46202 (317) 264-2277	(Same as Alternate)

STATE	BOARD MEMBER	ALTERNATE	TECHNICAL COORDINATOR
KENTUCKY	Mr. Robert E. Spillman, Director Program Supporting Services Division 2031 Capital Plaza Tower Frankfort, Kentucky 40601 (502) 564-3096	Dr. Charles D. Wade, Director Program Development Division Bureau of Vocational Education 2124 Capital Plaza Tower Frankfort, Kentucky 40601 (502) 564-3775	Mrs. Melissa Briscoe, Coordinator Competency Based Vocational Education Unit 2113 Capital Plaza Tower Frankfort, Kentucky 40601 (502) 564-3775
LOUISIANA	Dr. Harry J. Boyer, Director Bureau of Vocational Education State Department of Education P. O. Box 44064 Baton Rouge, Louisiana 70804 (504) 389-2981	Dr. Merline T. Broussard State Department of Education P. O. Box 44064 Baton Rouge, Louisiana 70804 (504) 389-2313	Dr. Clarence Ledoux, Supervisor Vocational Education Training State Department of Education P. O. Box 44064 Baton Rouge, Louisiana 70804 (504) 389-2981
MARYLAND	Dr. Robert E. Laird, Consultant Trades and Industrial Education Division of Vocational-Technical Education Maryland State Department of Education BWI Airport, P. O. Box 8717 Baltimore, Maryland 21240 (301) 796-8300	Dr. Gerald F. Day, Project Director Curriculum Development Division of Vocational-Technical Education Maryland State Department of Education BWI Airport, P. O. Box 8717 Baltimore, Maryland 21240 (301) 796-8300; Ext. 413	(Same as Alternate)
MICHIGAN	Mr. Philip Bailey Supervisor of Secondary Unit Vocational Education and Career Development Service Michigan Department of Education Box 30009 Lansing, Michigan 48909 (517) 373-3365	Dr. Addison Hobbs State Director of Vocational Education Box 30009 Lansing, Michigan 48909 (517) 373-3373	Dr. Tommie U. Johnson Technical Coordinator and Co-Director V-TECS Project Wayne State University 421 College of Education Detroit, Michigan 48202 (313) 577-1803
MISSISSIPPI	Dr. James Wall, Associate Dean College of Education Mississippi State University Box 5365 Mississippi State, Mississippi 39762 (601) 325-5878	Dr. Edward L. Thomas, Technical Coordinator Research Coordinating Unit for Vocational-Technical Education Mississippi State University Drawer DX State College, Mississippi 39762 (601) 325-2510	(Same as Alternate)

STATE	BOARD MEMBER	ALTERNATE	TECHNICAL COORDINATOR
PENNSYL-VANIA	Dr. John W. Struck State Director of Vocational Education Pennsylvania Department of Education Box 911 Harrisburg, Pennsylvania 17126 (717) 787-5530	Mr. Paul H. Schalles Assistant Director of Vocational Education Pennsylvania Department of Education Box 911 Harrisburg, Pennsylvania 17126 (717) 787-5530	Dr. Frank Rozman, V-TECS Coordinator Bureau of Vocational-Technical Education Department of Education Commonwealth of Pennsylvania Executive House Harrisburg, Pennsylvania 17126 (717) 787-4482
SOUTH CAROLINA	Dr. Emily T. Owens, Chief Supervisor of Program Planning and Development Office of Vocational Education 904 Rutledge Building Columbia, South Carolina 29201 (803) 758-2482	Mr. L. L. Lewis, Director Office of Vocational Education State of South Carolina Department of Education 908 Rutledge Building Columbia, South Carolina 29201 (803) 758-3101	Dr. Robert T. Benson Vocational Instructional Materials Specialist 10 Tillman Hall Vocational Education Media Center Clemson University Clemson, South Carolina 17126 (803) 656-3491 or 656-3115
TENNESSEE	Mr. Russell Smith, Chief of Program Services Division of Vocational Technical Education Tennessee Department of Education 200 Cordell Hull Building Nashville, Tennessee 37219 (615) 741-1320	Mr. John T. Leeman, Assistant Commissioner Division of Vocational Technical Education Tennessee Department of Education 200 Cordell Hull Building Nashville, Tennessee 37219 (615) 741-1716	Mr. Guy E. Wilmoth, Educational Specialist Program Services Division of Vocational Education State Department of Education 205 Cordell Hull Building Nashville, Tennessee 37219 (615) 741-3446 or 741-2860
VIRGINIA	Mr. L. M. Jewell, Jr., Coordinator Vocational Education Research and Statistical Information State Department of Education Richmond, Virginia 23216 (804) 786-1206	Dr. J. Dale Oliver Associate Professor of Education Division of Vocational and Technical Education Virginia Polytechnic Institute and State University Blacksburg, Virginia 24061 (703) 951-5237	(Same as Alternate)
WEST VIRGINIA	Mr. Clarence E. Burdette Assistant State Superintendent Vocational Technical and Adult Education Department of Education Charleston, West Virginia 25305 (304) 348-2346	Dr. Joseph Freund Director of Program Services Vocational Technical and Adult Education Department of Education Charleston, West Virginia 25305 (304) 348-3075	Dr. Fred W. Harrington Coordinator of Curriculum Development Vocational Technical and Adult Education Department of Education Charleston, West Virgnia 25035 (304) 348-7880

STATE	BOARD MEMBER	ALTERNATE	TECHNICAL COORDINATOR
WISCONSIN	Mr. Doyle Beyl, Bureau Director Board of Vocational, Technical and Adult Education 4802 Sheboygan Avenue - 7th Floor Madison, Wisconsin 53702 (608) 266-1354	Mr. Roland Krogstad, Consultant, Research Hill Farms State Office Building 4802 Sheboygan Avenue - 7th Floor Madison, Wisconsin 53702 (608) 266-3705	(Same as Alternate)
ASSOCIATE MEMBERS			
U.S.NAVY	Dr. Worth Scanland, Director Research and Program Development Building 679 Naval Education & Training Command Pensacola, Florida 32508 (904) 452-3466 or 452-3467	Mr. Dwight D. Davis Career Development Building 679 Naval Education & Training Command Pensacola, Florida 32508 (904) 452-3466 or 452-3467	(Same as Alternate)
U.S. AIR FORCE	Lt. Col. Wade R. Kilbride Chief, Professional Relations Community College of the Air Force/RLO Lackland AFB, Texas 78236 (512) 671-5255/5295	Capt. Dale F. Campbell Chief of Associates & Institutions Professional Relations Division Lackland AFB, Texas 78236 (512) 671-5255/5295	TSgt. Steve Simonson Curriculum Advisor Community College of the Air Force Lackland AFB, Texas 78236 (512) 671-5255/5295

ADMINISTRATIVE AGENCY

Dr. Bob E. Childers, Executive Secretary*
Commission on Occupational Education Institutions
Southern Association of Colleges and Schools
795 Peachtree Street, N.E.
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(404) 875-8011

Dr. Ben A. Hirst, Jr., Executive Director
Vocational-Technical Education Consortium of States
Commission on Occupational Education Institutions
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(404) 875-8011

STAFF

These staff members are located at the following address:

Vocational-Technical Education Consortium of States (V-TECS)
Commission of Occupational Education Institutions (COEI)
Southern Association of Colleges and Schools
795 Peachtree Street, N.E.
Atlanta, Georgia 30308
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*Ex Officio Member of the Board

Dr. LeRoy M. Netrick, Technical Consultant for Data Utilization Services

Billy J. Koscheski, Technical Consultant for Product Development Services

Dr. Tony M. Hinson, Technical Consultant for Computer Systems and Services

Victor L. Harville, Technical Consultant for Research and Statistical Services

Dr. J. Jerome Rohrbach, Jr., Technical Consultant for Research Services

STATE DIRECTORS OF VOCATIONAL EDUCATION IN PARTICIPATING V-TECS STATES

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Dr. Russell S. Clark
Assistant State Superintendent
Department of Education
Office of Adult & Vocational Education
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State Director/Executive Officer
Board of Vocational and Technical Education
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Mr. Billy Howard, Director
Bureau of Vocational Education
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Mr. L. L. Lewis, Director
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Mr. John T. Leeman, Assistant Commissioner
Division of Vocational Technical Education
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Vocational Education
State Department of Education
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Richmond, Virginia 23216
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State Director of Vocational Education
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(304) 348-2346

Mr. Eugene Lehrmann
State Director of Vocational Education
4802 Sheboygan Avenue
Madison, Wisconsin 53702
(608) 266-1770

APPENDIX C

MEMBERS OF THE COMMITTEES OF THE V-TECS BOARD OF DIRECTORS AND THE TECHNICAL COORDINATORS TASK FORCE

Member of the Committees of the V-TECS Board of Directors and the Technical Coordinators Task Force

Executive Committee

Dr. Emily Owens*
Dr. Bob E. Childers
Dr. Ben A. Hirst, Jr.
Mr. L. M. Jewell
Mr. Robert Spillman
Ms. Ruth Stovall

Planning Committee

Dr. Worth Scanland*
Mr. Clarence E. Burdette
Dr. John F. Crittenden
Mr. Ed Hornback
Dr. Emily Owens
Mr. Wiley Simpson

Product Development Committee

Mr. Philip Bailey
Mr. L. M. Jewell
Mr. W. J. Kistler
Mr. Robert E. Laird
Dr. John W. Struck
Mr. Robert Spillman

Evaluation Committee

Dr. James Wall*
Mr. Doyle Beyl
Dr. Harry Boyer
Dr. Bob E. Childers
Lt. Col. Wade Kilbride
Mr. John T. Leeman
Ms. Ruth Stovall

TECHNICAL COORDINATORS TASK FORCE

TASK FORCE MEMBERSHIP

Dr. Wallace Hunter*
Dr. Robert Benson
Mr. James Kendrick
Dr. J. Dale Oliver
Dr. Bill West

*Chairman
**Ex Officio Member

APPENDIX D

V-TECS STAFF RESUMES

DR. BOB E. CHILDERS, EXECUTIVE SECRETARY

VOCATIONAL-TECHNICAL EDUCATION
CONSORTIUM OF STATES
COMMISSION ON OCCUPATIONAL EDUCATION
INSTITUTIONS
SOUTHERN ASSOCIATION OF COLLEGES
AND SCHOOLS

EDUCATION: Dr. Childers holds an Ed.D. degree in Education from the University of Tennessee, and a M.A. degree from Memphis State University and the B.A. degree from Union University in Tennessee.

TEACHING EXPERIENCE: United States Navy, Civil Service, Memphis, Tennessee from 1957 to 1960. Instructed Navy aviation officer personnel in the advanced systems of avionics including altimeter, fire control, guided missles, radiological warfare, loran, and tacan. Instructed Navy officer personnel in English Composition, technical report writing, public speaking, and mechanical drafting. Developed publication material, courses of study, and lesson guides for the above areas for use of Naval officers in regular technical institute classes.

North Carolina State University, School of Education, Raleigh, North Carolina. Adjunct Professor from 1972 to present. Directed internship of four State Department of Education Fellows.

EMPLOYMENT: Responsible for directing the development and implementation of the SACS Program for improvement of post-secondary Occupational Education through the process of accreditation and for coordinating various research and evaluation activities to improve vocational-technical and career education.

Among other research efforts, Dr. Childers served as Project Coordinator for a special research project to develop and refine the computer capabilities of the Vocational-Technical Education Consortium of States and to study the feasibility of adapting the V-TECS catalogs for use in occupational training programs for handicapped persons. This project was funded in FY1974 by the U.S. Office of Education under Part C of the Vocational Education Act of 1963, as amended in 1968, and conducted as an intergral part of the total V-TECS effort. 7/1/69 to present.

SELECTED PUBLICATIONS:

1975 "Certifying a New Level of Professionalism", Council for Occupational Education, American Association of Community and Junior Colleges, Washington, D.C., October 10, 1975.

1976 "Professional Certification of T & I Instructors", Report of National Conference for T & I Education Professional Development, January 14, 1976.

1976 "Third Party Evaluation of Teacher Education", North Carolina State Department of Education, Raleigh, N. C., November 11, 1976.

1976 "Occupational Accreditation", SE/SW Regional Conference Proceedings of ATEA, October 29, 1976.

1977 "Accreditation of Proprietary Occupational Schools", Report of the Region IV & V, Proprietary Schools Association, February 17, 1977.

1977 Editor of AVA Accreditation Committee, "Philosophy", "Constitution", "Bylaws", and "Plan" for the National Commission for Accreditation of Vocational Education, November, 1976 to March, 1977.

BENJAMIN A. HIRST, JR., EXECUTIVE DIRECTOR

VOCATIONAL-TECHNICAL EDUCATION
CONSORTIUM OF STATES
COMMISSION ON OCCUPATIONAL EDUCATION
INSTITUTIONS
SOUTHERN ASSOCIATION OF COLLEGES
AND SCHOOLS

EDUCATION: Dr. Hirst holds an Ed.D. degree in Vocational-Technical Education from the University of Tennessee, Knoxville, Tennessee, and a M.A. degree and B.S. degree from Middle Tennessee State University.

TEACHING EXPERIENCE: Dr. Hirst taught graduate level courses at the University of Tennessee, supplementary courses in blueprint reading and math to tool and die apprentices and was a machine shop teacher for three years with the Decatur County Schools in Parsons, Tennessee. Also, Dr. Hirst has been a visiting lecturer at several universities.

EMPLOYMENT: Dr. Hirst served an internship with the Commission on Occupational Education Institutions, Southern Association of Colleges and Schools. Upon completion of the internship, he became Project Director for the Feasibility Study leading to the Formation of V-TECS. As an EPDA Fellow, he served a Research Internship with the Research Coordinating Unit for Vocational Education, Knoxville, Tennessee. Formerly, Dr. Hirst was employed by the State Department of Education, Nashville, Tennessee, for seven years. During this time, he served as State Coordinator, State Director, and Supervisor of the Area Vocational-Technical Schools. Other employment includes four years as a tool and die maker and four years as a U.S. Navy Machinist.

Dr. Hirst has been with the Southern Association of Colleges and Schools since August, 1972. In June, 1973, he was appointed to his present position as Executive Director of the Vocational-Technical Education Consortium of States. In this capacity, he is responsible for directing the overall functioning of the Consortium and for supervising activities leading to the production and implementation of catalogs of performance objectives and criterion-referenced measures in vocational education. This involves working with the central staff, Division of Vocational Education in sixteen states, the U.S. Office of Education, the Air Training Command represented by the Community College of the Air Force, the Aerospace Education Foundation, the U.S. Naval Education and Training Command, representatives of business/industry/labor; and one national curriculum center.

SELECTED PUBLICATIONS:

1975-76 "A Project to Computerize Performance Objectives and Criterion-Referenced Measures in Occupational Education for Research and Determination of Applicability to Handicapped Learners." Atlanta, Georgia: Southern Association of Colleges and Schools, 1975 (Interim Report), 1976 (Final Report). OEG-074-8581

1974 "Progress and Information Report for the Vocational-Technical Education Consortium of States." Atlanta, Georgia: Southern Association of Colleges and Schools, 1974.

1974 "A Consortium for Accountability." Technical Education Reporter, Vol. 1, No. 3, September-October, 1974.

1974 "An Application of the Delphi Technique to Develop and Activity Model for the Vocational-Technical Education Consortium of States." Published Dissertation, Atlanta, Georgia: SACS, 1974.

TONY M. HINSON, TECHNICAL CONSULTANT FOR
COMPUTER SYSTEMS AND SERVICES

VOCATIONAL-TECHNICAL EDUCATION
CONSORTIUM OF STATES
COMMISSION ON OCCUPATIONAL EDUCATION
INSTITUTIONS
SOUTHERN ASSOCIATION OF COLLEGES
AND SCHOOLS

EDUCATION: Dr. Hinson holds an Ed.D. degree in Vocational-Technical Education from the University of Tennessee, Knoxville, Tennessee, a M.S. degree in Mathematics and a B.S. degree in Electrical Engineering from Tennessee Technological University, Cookeville, Tennessee.

TEACHING EXPERIENCE: In Tennessee, Dr. Hinson served two years as a Mathematics, Electronics, and Computer Science Instructor at Dyersburg State Community College; one year in Mathematics and Electronics at Columbia State Community College; and two years as a graduate teaching assistant in Mathematics at Tennessee Technological University.

EMPLOYMENT: Dr. Hinson spent four years as a Research Engineer with the National Aeronautics and Space Administration, served as a Research Engineer with the Boeing Company, and as a Consultant Engineer with Associate Engineering, Inc.

Dr. Hinson served internships with the Division of Vocational Education in the Knoxville City School System; with the Research Coordinating Unit for Vocational Education at the University of Tennessee as an EPDA Fellow; and with the Vocational Education Department for the State of Tennessee. Upon graduating from the University of Tennessee, Dr. Hinson became the Director of Planning for the Winston-Salem/Forsyth County Schools, Winston-Salem, North Carolina.

In August, 1974, Dr. Hinson assumed his present position as Technical Consultant for Computer Systems and Services with the Vocational-Technical Education Consortium of States. His primary responsibility is for planning, designing, and coordinating the overall computer software and hardware system used by V-TECS member states. Dr. Hinson designs and writes special statistical computer routines and reports, compiles documentation on all computer routines, maintains a remote job entry system, and prepares research reports and other technical documents. He designed and implemented Management Information Systems including PERT, DELPHI , a Bayesian Analysis Technique, and a system to permit computer storage, retrieval, and updating of V-TECS catalogs. This latter system was made possible through a grant by the U.S. Office of Education in FY74. Dr. Hinson has served on several evaluation teams and is a member of several professional associations in education and engineering.

SELECTED PUBLICATIONS:

1977 "A Technical Report of the Housing Management Career Field." Atlanta, Georgia: Southern Association of Colleges and Schools.

1976 "Progress and Information Report for the Vocational-Technical Education Consortium of States." Atlanta, Georgia: Southern Association of Colleges and Schools.

1975 "A Project to Computerize Performance Objectives and Criterion-Referenced Measures in Occupational Education for Research and Determination of Applicability to Handicapped Learners." Atlanta, Georgia: Southern Association of Colleges and Schools (Interim Report) (1976, Final Report).

1973 "Guidelines for Using Electronic Data Processing in Community

Colleges and Technical Institutions." unpublished dissertation. Knoxville, Tennessee, University of Tennessee.

1968 "Determinants of Special Matrices," The Mathematical-Monthly.

1968 "Determinants of Special Matrices," unpublished thesis. Cookeville, Tennessee, Tennessee Technological University.

VICTOR L. HARVILLE, TECHNICAL CONSULTANT FOR
RESEARCH AND STATISTICAL SERVICES

VOCATIONAL-TECHNICAL EDUCATION
CONSORTIUM OF STATES
COMMISSION ON OCCUPATIONAL EDUCATION
INSTITUTIONS
SOUTHERN ASSOCIATION OF COLLEGES
AND SCHOOLS

EDUCATION: Mr. Harville holds an M.A. degree from Emory University, Atlanta, Georgia and a B.A. degree from Evangel College, Springfield, Missouri.

EMPLOYMENT: Mr. Harville was formerly employed by the Georgia Department of Human Resources. He served as a Senior Research Associate with the State Center for Human Service Statistics, Office of Evaluation and Research. Some of his duties included consulting on research design and analysis, formulating strategies for program evaluation, administering ad hoc research projects, and working with the Governor's Office of Planning and Budget in the development and implementation of an organizational model for the department's welfare services. Prior to this position, he worked for the Division of Program Planning, Evaluation and Research within the Department as a Supervisor of the Operations Research Unit. He conducted research projects and coordinated the planning and field testing of the Human Resources Information System.

Before joining the Department of Human Resources, Mr. Harville worked for the Georgia Department of Family and Children Services where he held several different positions over a period of six years. These positions ranged from statistical Research Assistant to Chief of the Research Section. His responsibilities included the supervision of research data, survey interviews, and statistical report preparation.

In August, 1976, Mr. Harville assumed his present position as Technical Consultant for Research and Statistical Services with the Vocational-Technical Education Consortium of States. In this capacity, he is primarily responsible for providing staff assistance to member states in sampling, data collection procedures, and statistical and research designs. He also conducts ad hoc research studies and conducts in-service training programs for member states.

SELECTED PUBLICATIONS:

1975 Case Characteristics and Error in the Aid to Families with Dependent Children Program. Georgia Department of Human Resources.

1974 Aid to Families with Dependent Children: Growth, Benefits and Inflation. Georgia Department of Human Resources.

1970 Dynamics of Children in Foster Care. Georgia Department of Family and Children Services.

1969 The AFDC Family in Georgia. Georgia Department of Family and Children Services.

1967 Recidivism: A Study of Delinquents in Georgia. Georgia Department of Family and Children Services.

BILLY J. KOSCHESKI, TECHNICAL CONSULTANT FOR
PRODUCT DEVELOPMENT SERVICES

VOCATIONAL-TECHNICAL EDUCATION
CONSORTIUM OF STATES
COMMISSION ON OCCUPATIONAL EDUCATION
INSTITUTIONS
SOUTHERN ASSOCIATION OF COLLEGES
AND SCHOOLS

EDUCATION: Mr. Koscheski holds a B.A. degree from Park College, Parkville, Missouri and is currently enrolled in a masters degree program at Georgia State University, Atlanta, Georgia.

TEACHING EXPERIENCE: Mr. Koscheski served four years as an instructor in the Administrative Specialist Course, U.S. Air Force. He has also conducted various workshops in the development and maintenance of criterion-referenced instructional systems.

EMPLOYMENT: Mr. Koscheski spent 22 years (1952-1974) in the United States Air Force, during which time he served in the Administrative and Instructional System Development fields. His last 10 years in the military were spent developing and analyzing criterion-referenced instructional systems. While serving as Curriculum Advisor to the Community College of the Air Force, Mr. Koscheski screened requests for curricular materials received from civilian institutions and selected appropriate Air Force course materials compatible with their needs. Prior to that, he assisted the Utah State Department of Education in the selection and use of Air Force training materials; developed plans for the operational use of programmed learning within the Air Force; and assisted in developing instructional systems for the Air Force including writing performance objectives, constructing criterion tests, and planning the implementation of delivery systems.

In September, 1974, Mr. Koscheski assumed his present position as Technical Consultant with the Vocational-Technical Education Consortium of States. In this capacity, his primary responsibility is to assist member states in the development of performance objectives and criterion-referenced measures. He conducts in-service training workshops in writing performance objectives and criterion measures, the uses of V-TECS catalogs, and catalog implementation strategies. He is a member of several military and educational professional organizations.

SELECTED PUBLICATIONS:

1976 "Third Progress and Information Report for the Vocational-Technical Education Consortium of States," Southern Association of Colleges and Schools.

1971-72 The Utah Project, USAF Instructors Journal, Winter, 1971-1972, pp. 29-32.

1966 Does Technique Tell the Story? USAF Instructor's Journal, Spring, 1966, pp. 20-21.

1964-67 Various instructional programs for the Medical Services School, USAF. Consisted primarily of programmed instructional packages (including objectives and tests) for medical laboratory and medical services specialists.

LEROY M NETRICK, TECHNICAL CONSULTANT FOR
DATA UTILIZATION

VOCATIONAL-TECHNICAL EDUCATION
CONSORTIUM OF STATES
COMMISSION ON OCCUPATIONAL EDUCATION
INSTITUTIONS
SOUTHERN ASSOCIATION OF COLLEGES
AND SCHOOLS

EDUCATION: Mr. Netrick holds a B.S. degree in Education from West Texas State University, Canyon, Texas, a M.A. degree in Educational Administration from Denver University, and has completed a dissertation and will be awarded a Ph.D. degree at Georgia State University, Atlanta, Georgia, in August, 1977.

TEACHING EXPERIENCE: Mr. Netrick served 18 years as an instructor in mathematics and teacher education in the United States Air Force, and taught for seven years secondary level mathematics and vocational education in public schools.

EMPLOYMENT: Mr. Netrick spent 22 years in the United States Air Force (1950-1972), was a field representative for a major publisher, worked as a Coordinator of Instruction, and as a Principal for an Adult Education Program for six years.

In civilian life Mr. Netrick was a welder, a draftsman, and owned and operated a restaurant. He presently owns and operates a logging operation. While in the military, he developed and wrote 23 courses for the professionalization of U.S. Air Force instructor personnel, advised students on career development, and served as Consultant on a 1972 accreditation program in the area of statistics. He worked with the Southeast Metropolitan Board of Cooperative Services in Denver designing proposals, program coordination, and public relations in the area of continuing education. Just prior to joining V-TECS, Mr. Netrick represented a major publisher of educational materials conducting many in-service training sessions for teachers of kindergarten through college, hosting major educational meetings and professional organizations, and advising administrators on the development of curriculum systems.

In November, 1973, Mr. Netrick assumed his present position as a Technical Consultant for Data Utilization with the Vocational-Technical Education Consortium of States. His duties include assisting member states in writing task statements, developing occupational inventories, and interpreting occupational survey data. He conducts in-service training workshops in these areas and coordinated the printing and dissemination of final products to participating states. Mr. Netrick is a member of several professional educational associations.

SELECTED PUBLICATIONS:

1975 "Second Progress and Information Report for the Vocational-Technical Education Consortium of States," Southern Association of Colleges and Schools.

1974 "Guidelines for Developing Job Inventory Task Booklets," Southern Association of Colleges and Schools.

1967 "Teaching Manipulative Skills," Colorado Department of Education.

1963 "Manual for Instructional System Development," United States Air Force.

J. JEROME ROHRBACH, JR., TECHNICAL CONSULTANT FOR
RESEARCH SERVICES

VOCATIONAL-TECHNICAL EDUCATION
CONSORTIUM OF STATES
COMMISSION ON OCCUPATIONAL EDUCATION
INSTITUTIONS
SOUTHERN ASSOCIATION OF COLLEGES
AND SCHOOLS

EDUCATION: Dr. Rohrbach holds an Ed.D. degree in Vocational Education from the University of Georgia, Athens, Georgia, a M.In.Ed. degree and B.S. degree in Industrial Education from Clemson University, Clemson, South Carolina, and an A.A. degree from Anderson College, Anderson, South Carolina.

TEACHING EXPERIENCE: From 1973 - May, 1976, Dr. Rohrbach was an assistant professor at West Georgia College, Carrollton, Georgia. In this capacity, he taught teacher certification courses in vocational education, was assistant project director for the Comprehensive Vocational Career Education (CVCE) project, project director for the Northwest Georgia Cooperative Education Service Agency and V-TECS projects, and assisted in the development of the graduate and undergraduate degree proposals for T & I education. From 1970-1973, conducted vocational education and career education workshops and internships for vocational and career education teachers as an EPDA Fellow at the University of Georgia, Athens, Georgia. From 1968-70, was an instructor at Clemson University, teaching skilled and professional courses for industrial arts teachers and industrial option majors. From 1967-68, was a graduate teaching assistant at Clemson University, Clemson, South Carolina. From 1956-66, served as instructor cadre in the South Carolina National Guard. During 1960-61, was an FCC night school instructor at Murray Vocational High School, Charleston, South Carolina.

EMPLOYMENT: From 1963-1967, electronic parts salesman at Brookshire Radio Supply, Anderson, South Carolina. During 1962-1963, employed as electronic service repairman for Western Union Telegraph Company, Charleston, South Carolina. From 1956-1962, was electronic parts sales/serviceman at Radio Laboratories, Charleston, South Carolina

Dr. Rohrbach assumed his present position as Technical Consultant for Research Services with the Vocational-Technical Education Consortium of States on May 16, 1977. His duties include planning and conducting research studies and assisting member states in conducting state-of-the-art research studies.

SELECTED PUBLICATIONS:

1977 With O. Scott. "A Comparison of Five Criteria for Identifying Fakable Items on an Attitude Inventory." The Journal of Experimental Education, 45:51-55, Spring, 1977.

1977 With B.G. Hirst. A Catalog of Performance Objectives, Criterion-Referenced Measures, and Performance Guides for Emergency Medical Technician. Atlanta: Georgia Department of Education.

1976 A Catalog of Performance Objectives, Criterion-Referenced Measures, and Performance Guides for Programmers. Atlanta: Georgia Department of Education.

1976 Glossary of Terms for Programmer Catalog. Atlanta: Georgia Department of Education.

1975 With B.G. Hirst. A Catalog of Performance Objectives, Criterion-Referenced Measures, and Performance Guides for Machine Shop. Atlanta: Georgia Department of Education.

1974 "A Refinement of the Attitude Toward Disabled Persons Scale to Reduce Fakability and Increase Measurement of Change." Unpublished Ed.D. dissertation, University of Georgia.

1974 With C.J. Sisson. "Elementary Career Education (K-6): A Staff Development Guide." Carrollton, Georgia: West Georgia College.

1972 With N.R. Frantz. "A Curriculum Guide for a Career Exploration Program in the Middle/Junior High Schools of Georgia for Industrial Arts Education." Atlanta: Georgia Department of Education.

DR. CONNIE W. LEE, TECHNICAL CONSULTANT FOR
RESEARCH SERVICES

VOCATIONAL-TECHNICAL EDUCATION
CONSORTIUM OF STATES
COMMISSION ON OCCUPATIONAL EDUCATION
INSTITUTIONS
SOUTHERN ASSOCIATION OF COLLEGES
AND SCHOOLS

EDUCATION: Dr. Lee holds a Ph.D. from Ohio State University in Education with a M.S. degree in Computer Science and a B.S. degree in Math from Ohio State.

TEACHING EXPERIENCE: Ohio State University, College of Education. Assisted faculty members in teaching courses in elementary statistics, research design, and proposal writing to graduate students in education. Consulted with undergraduate students majoring in educational research and development and coordinated individual work-study experiences.

Ohio State University, Division of Continuing Education. Taught courses in FORTRAN programming to adults enrolled in evening classes.

EMPLOYMENT: In V-TECS, responsible for planning and conducting internal research studies, preparing research and other technical reports and proposals, assisting member states in conducting state-of-the-art research studies in selected occupations, and assisting in the design on computer base maintained by the Vocational-Technical Education Consortium of States (V-TECS). Plans and organizes in-service training programs. Served as Research Specialist on twenty-one month project funded in FY74 by the U.S. Office of Education under Part C of the Vocational Education Act of 1963, as amended in 1968. In this capacity, designed and conducted a research study to determine the feasibility of adapting V-TECS catalogs for use in occupational training programs for handicapped persons.

Also, worked at the Center for Vocational and Technical Education, Columbus, Ohio, Research Specialist. Responsible for planning and conducting those evaluation tasks necessary to help assure and assess the quality of R&D products. This position required supervistion of graduate research assistants and ability to work effectively with Research and Development program personnel. Had major responsibility for planning and conducting a nationwide field tryout to evaluate a manual developed for use by curriculum developers in constructing and using occupational task inventories. Wrote a request for proposal (RFP) for third-party evaluation of a set of performance-based teacher education modules developed by the Center.

SELECTED PUBLICATIONS:

1976 "Third Progress and Information Report for the Vocational-Technical Education Consortium of States," Southern Association of Colleges and Schools.

1976 "A Project to Computerize Performance Objectives and Criterion-Referenced Measures in Occupational Education for Research and Determination of Applicability to Handicapped Learners: Final Report," Southern Association of Colleges and Schools.

1976 "Development, Application, and Refinement of a Model for Evaluating Cooperative Efforts in Performance-Based Vocational Education," presented to the U.S. Office of Education, Washington, D.C. Southern Association of Colleges and Schools.

1975 "A Project to Computerize Performance Objectives and Criterion-Referenced Measures in Occupational Education for Research and Determination of Applicability to Handicapped Learners: Interim Report," Southern Association of Colleges and Schools.

1973 "Evaluation Framework for Assessing Social Service Programs." Report to HJS and Associates, Columbus, Ohio, December 1973. (Collaborated with Charles J. Murphy and Howard J. Spiller).

1973 "Final Report: Instructor Training Program I." The Center for Vocational and Technical Education, Ohio State University, 1973. (Collaborated with Robert E. Andreyka).

1973 "A Comparative Study of Cost-Benefit Analysis Results Using Different Measures of Prior Earnings." Unpublished Ph.D. dissertation, Ohio State University, 1973.

APPENDIX E

ANALYSIS OF D.O.T. JOB TITLES

BY PROJECT DATA

VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES

ANALYSIS OF D.O.T. JOB TITLES BY PROJECT DATA

JULY, 1977

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED D.O.T.'S	
		D.O.T. Number	D.O.T. Job Title
ALABAMA			
Air Conditioning and Refrigeration 17.0100	1111	637.281-010	A/C Mechanic, Commercial
		637.281-034	Refrigeration Mechanic, Commercial
		620.281-010	A/C Mechanic, Auto Services
		637.281-014	A/C Mechanic, Domestic
		827.884-014	A/C Installer, Domestic
Radio/TV Repairman 17.1503	1112	720.281-018	TV Service and Repairman
		187.168-138	TV Sales and Service Supervisor
Nurseryman 01.0505	1120	406.168-010	Nurseryman
		406.884-010	Laborer, Nursery
		406.887-030	Nursery Worker
Bookkeeper	1121	215.488-010	Payroll Clerk
		210.388-088	Bookkeeping/Accounting Clerk
Auto Parts Clerk	1122	289.358-064	Parts Counterman
		289.358-068	Counterman, Automotive Parts

Analysis of D.O.T. Job Titles by Project Data (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED D.O.T.'S	
		D.O.T. Number	D.O.T. Job Title
ALABAMA (continued)			
Licensed Practical Nurse 07.0302	1123	079.378-026	LPN
Alterationist	1124	785.281-010	Alterationist Tailor
		785.381-026	Seamstress, Alteration
Cosmetology 17.2602	1125	332.271-010	Cosmetologist
		331.878-010	Manicurist
		332.271-038	Managing Cosmetologist
Masonry 17.1004	1126	861.381-010	Bricklayer, Construction
Travel Agent	1131	D.O.T. to be assigned	
Cattle Ranching 01.0101	1132	413.181-010	Cattle Rancher
		413.884-030	Ranch Hand
		413.884-018	Farm Hand, Livestock
DELAWARE			
Sheet Metal 17.2305	3001	616.380-030	Set-up Man, Sheet Metal
		616.380-034	Sheet Metal Fabricating Machine Operator
		804.281-010	Sheet Metal Worker

Analysis of D.O.T. Job Titles by Project Data (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED D.O.T.'S	
		D.O.T. Number	D.O.T. Job Title
DELAWARE (continued)			
Sheet Metal 17.2305	3001	809.381-026	Sheet Metal Lay-Out Man
Warehousing 04.1900	3002	922.887-060	Warehouseman
		929.887-050	Material Handler
		922.887-064	Stock Boy
FLORIDA			
Sod Production 01.0506	1220	407.999-010	Sod Production Worker
Auto Body 17.0301	1221	807.381-010	Auto Body Repairman
Golf Course 01.0506	1222	407.883-010	Greenskeeper II
Auto Mechanics 17.0302	1223	620.281-014	Mechanic, Auto
		620.381-014	Auto Services, Machanic
		620.884-010	Auto Mechanic Helper
Combination Welding 17.2306	1236	812.288-022	Welder, Repair
		812.384-018	Welder, Production

Analysis of D.O.T. Job Titles by Project Data (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED D.O.T.'S	
		D.O.T. Number	D.O.T. Job Title
FLORIDA (continued)			
Floriculture 01.0502	1237	406.180-010	Flower Grower
		406.181-034	Flower Grower, Greenhouse
Hospital Ward Clerk 14.0499	1238	219.388-286	Ward Clerk, Hospital
County Tax Collector 14.9901	1239	188.168-066	Tax Collector, County
		188.168-072	Deputy/Assistant Tax Collector
		188.168-014	Tax Collection Specialist
Housing Manager 04.1700	1299	188.168-028	Housing Manager
		189.168-044	Housing Management Aide
		184.168-112	Housing Maintenance Supervisor
		195.108-066	Social Service Supervisor
		188.168-036	Housing Occupancy Clerk
Dressmaking	1241	D.O.T. to be assigned	
Health Occupations 07.0203	1242	078.381-010	Medical Laboratory Asst.
		078.687-010	Laboratory Assistant, Plasma Draw-Off
Public Service Occupations 17.2899	1243	168.168-010	Building Inspector

Analysis of D.O.T. Job Titles by Project Data (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED D.O.T.'S	
		D.O.T. Number	D.O.T. Job Title
FLORIDA (continued)			
Public Service Occupations 17.2899	1243	168.168-034	Building Inspector, Residential
Homemaker	1244	D.O.T. to be assigned	
GEORGIA			
Data Processing 14.0201	1331	213.382-018	Digital Computer Operator
		213.138-010	Supervisor, Computer Operator
Machinist 17.2302	1332	609.885-022	Machinist
Programmer 14.0203	1343	020.188-026	Programmer, Business
		020.168-005	Chief Business Programmer
Emergency Medical 07.0907	1344	354.878-010	First Aid Attendent
		355.878-026	Emergency Entrance Attendant
Electronic Technician 16.0108	1355	033.181-014	Electronic Technician
		828.281-022	Electronics Mechanic
		829.281-034	Field Engineer

Analysis of D.O.T. Job Titles by Project Data (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED D.O.T.'S	
		D.O.T. Number	D.O.T. Job Title
GEORGIA (continued)			
Appliance Repair 17.0200	1356	827.281-018	Household Appliance Installation Man
		827.281-022	Household Appliance Repairman
INDIANA			
Agrichemical	3331	D.O.T. to be assigned	
Drafting	3332	D.O.T. to be assigned	
KENTUCKY			
Dental Assistant 07.0101	1441	079.378-010	Dental Assistant
Tractor Mechanic	1442	620.281-094	Tractor Mechanic
		620.884-050	Tractor Mechanic Helper
Cashier/Checker 04.0600	1443	299.468-010	Cashier/Checker
Construction Carpenter 17.1001	1444	860.381-026	Carpenter, Construction
		860.781-014	Carpenter, Rough
Bank Teller	1445	212.368-010	Teller

Analysis of D.O.T. Job Titles by Project Data (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED D.O.T.'S	
		D.O.T. Number	D.O.T. Job Title
KENTUCKY (continued)			
Child Care 09.0201	1446	359.878-010	Child Care Attendant
Industrial Electrician 17.1002	1453	824.281-014	Electrician, Industrial
		829.887-014	Electrician, Industrial Helper
		829.887-014	Electrician, Industrial Repair
Legal Secretary 07.0904	1454	201.368-010	Legal Secretary
		202.388-010	Court Reporter
Medical Assistant 07.0904	1455	079.368-022	Medical Assistant, General
		079.368-034	Medical Assistant, Administrative
		079.368-046	Medical Assistant, Clinic
Drapery Worker 09.0204	1456	299.381-014	Drapery Measuremen
		299.488-010	Drapery Estimator
		780.381-026	Home Furnishing Aide
		785.381-250	Drapery Seamstress
		787.782-086	Drapery Worker
Floral Sales 04.0500	1457	142.081-050	Floral Designer

Analysis of D.O.T. Job Titles by Project Data (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED D.O.T.'S	
		D.O.T. Number	D.O.T. Job Title
KENTUCKY (continued)			
Floral Sales 04.0500	1457	260.458-010	Salesperson, Flowers
Agriculture Parts Clerk 01.0305	1458	185.168-090	Agriculture Equipment Parts Man
		185.168-092	Agriculture Equipment Parts Clerk
Appliance Sales 04.1000	1461	278.358-030	Sales Person, TV & Appliance
		278.258-018	Sales Person, Hi-Fi
		278.358-010	Sales Person, Gas or Electrical Appliance
LOUISIANA			
Ship Operations 17.0802	2095	197.168-010	Master, Ship
		197.133-034	Tug Boat and Ship Mate
		911.884-010	Able Seaman
		197.130-014	Marine Engineer
		315.381-022	Cook, Ship
Hotel/Motel Management 04.1100	2096	187.118-030	Manager, Hotel
		187.118-034	Manager, Motel

Analysis of D.O.T. Job Titles by Project Data (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED D.O.T.'S	
		D.O.T. Number	D.O.T. Job Title
LOUISIANA (continued)			
Hotel/Motel Management 04.1100	2096	187.168-094	Manager, Front Office
		211.468-034	Desk Clerk
		324.138-014	Bell Captain
Petroleum Technician	2011	D.O.T. to be assigned	
Oilfield Technician	2012	D.O.T. to be assigned	
Water Operator 17.3203	2013	954.782-014	Water Treatment Plant Operator
		955.782-018	Sewage Plant Operator
		955.885-014	Water/Waste Water Operator
Police Operator 17.2802	2014	375.268-030	Patrolman
Diesel Machanic 17.1200	2015	D.O.T. to be assigned	
MARYLAND			
Executive Secretary	3221	169.168-018	Executive Secretary
		169.168-014	Administrative Secretary
Word Processing	3222	208.588-026	Transcribing Machine Operator

Analysis of D.O.T. Job Titles by Project Data (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED D.O.T.'S	
		D.O.T. Number	D.O.T. Job Title
MARYLAND (continued)			
Word Processing	3222	201.368-056	Correspondence Secretary
MICHIGAN			
Law Enforcement 17.2802	3441	372.868-024	Security Guard
		372.868-032	Watchman
		372.868-036	Special Policeman
Printing Press 17.1902	3442	973.381-010	Compositor
		651.782-038	Offset-Duplicating Machine Operato
		979.381-014	Finisher
		979.381-012	Camera Copy
		651.782-042	Offset/Pressman
MISSISSIPPI			
Plumbing 17.1007	1551	862.381-074	Plumber, Construction
		862.381-082	Plumber, Maintenance
Landscaping 01.0504	1552	407.884-010	Groundskeeper
		507.181-010	Landscape Gardner

Analysis of D.O.T. Job Titles by Project Data (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED D.O.T.'S	
		D.O.T. Number	D.O.T. Job Title
MISSISSIPPI (continued)			
Cotton Gin 01.0402	1563	461.885-014	Ginner
		461.885-010	Lead Worker
		466.885-018	Gin Manager
Industrial Sewing 17.3399	1564	789.132-010	Foreman, Sewing Room
		786.782-090	Sewing Machine Operator Regular
		786.885-034	Sewing Machine Operator Special Equipment
		787.782-290	Sewing Machine Operator All Around
Rural Health Worker 07.0906	1571	354.878-016	Rural Health Worker
		354.878-012	Rural Health Trainee
		354.878-020	Family Health Worker
		355.878-032	Nursing Home Worker
		354.878-014	Health Care Worker
SOUTH CAROLINA			
Textile Production 17.3399	2132	683.130-014	Loom Fixer Overseer
		683.280-018	Loom Fixer

Analysis of D.O.T. Job Titles by Project Data (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED D.O.T.'S	
		D.O.T. Number	D.O.T. Job Title
SOUTH CAROLINA (continued)			
Textile Production 17.3399	2132	683.380-014	Loom Changer
		681.280-014	Machine Repairman
Small Engine Repair 17.3100	2133	625.281-034	Engine Repairman
		625.281-042	Power Saw Mechanic
		625.281-032	Lawnmower Engine Repairman
		625.281-038	Outboard Motor Mechanic
Home Manager 09.0100	2144	D.O.T. to be assigned	
Business Machine Repairman 17.0600	2145	633.281-030	Office Machine Serviceman
		633.131-030	Office Machine Serviceman Foreman
		633.281-034	Office Machine Serviceman Apprentice
TENNESSEE			
House Electrician	3111	D.O.T. to be assigned	
Cabinet Maker	3112	D.O.T. to be assigned	
Homemaker	3113	D.O.T. to be assigned	

Analysis of D.O.T. Job Titles by Project Data (continued)

STATE AND PROJECT TITLE	PROJECT NUMBER	INCLUDED D.O.T.'S	
		D.O.T. Number	D.O.T. Job Title
VIRGINIA			
Secretarial 14.0702	1771	201.368-018	Secretary
		202.388-014	Stenographer
		203.588-018	Typist
		209.388-022	Clerk-Typist
Food Service 01.0703	1772	313.138-014	Head Cook
		313.381-018	Cook
		317.887-010	Cook, Helper
		317.884-018	Pantry Person
		314.381-010	Short Order Cook
Logging 01.0703	1788	940.884-042	Woods Laborer
		183.168-044	Logging Foreman
Nurse Aide 07.0303	1789	355.878-034	Nurse Aide
		355.878-038	Orderly
Farm Equipment Operator	1790	D.O.T. to be assigned	